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THE MODERN PORCELAIN CROWN.

BY JOHN EGBERT NYMAN, D.D.S., CHICAGO. READ BEFORE THE MICHIGAN DENTAL ASSOCIATION, AT PORT HURON, JULY 11-13, 1899.

Probably the most frequent application of porcelain prosthesis at present is in the construction of inlays, crowns and bridges, and of these the individual crown is most often used. It is the writer's intention to briefly describe the construction of a modern porcelain crown, giving all the details essential to the highest possible mechanical and artistic result. The ideas are practical as well as theoretical, and have been tested during the last three years in practical cases in the mouth. Probably the first prerequisite is that the operator shall be a man of more than average mechanical skill. Second, he should possess rare discrimination, the lack of which causes so many of the failures. He must not imagine for a moment that he can put on a porcelain crown anywhere and everywhere without any regard to the length of bite or peculiarities of articulation, as he would were it a gold crown, and expect it to stay. Unlike some other writers on this subject, the writer finds himself from time to time confronted by cases in which he is compelled to make use of gold crowns, much as he prefers those of porcelain.

Occasionally the entire articulation is so close that at most but a comparatively thin section of porcelain can be placed over the metallic foundation, and it would be folly to place a porcelain crown upon any of the teeth. Frequently are presented second molars, superior and inferior, which must be crowned, but on the distal half of which the bite is so short that it would not do to risk a porcelain crown; in fact, it should not be placed upon a root, bicuspid or molar, where a thickness of at least three millimeters of porcelain between the cap covering the root and the occluding cusp of the antagonizing tooth cannot be obtained. The observance of these precautions will greatly minimize the failures of porcelain crowns.

The writer does not wish to be called egotistical, but would say that he has not had a failure in three years. This is not due so much to any skill that he may possess, but to the fact that he is always governed by this precaution when a case for crowning presents. Exercise of the same precaution on the part of other operators, and observance of the comparatively simple method detailed, will yield similarly fortunate results.

The functions of the different parts of a porcelain crown are as follows: The post is to secure retention of crown upon the root, and to support the porcelain facing by attachment to it of the platinum pins. This cap and band are to provide a hermetic covering for the root, to prevent the possible splitting of the root under pressure, to provide a joint between artificial and natural which shall be removed from the deleterious action of the fluids of the mouth, in a slight degree to assist in the retention of the crown, and to form a base upon which to build the porcelain body.

We will suppose that a case has presented in which all conditions are favorable for a porcelain crown. The first step is to ascertain whether the pulp is devitalized or not. If not, it must be done and the canals filled. Then the tooth is cut down within the sixteenth of an inch of the buccal gum margin. (Fig. 1.) The canal is then enlarged to allow the insertion of a post, which should be as long from the point of attachment to the cap as the length of the facing used in the construction of the crown will be. Such a post will be ample for the retention of the crown. One longer merely adds to the danger of perforation of the root in enlarging the canal, while one shorter is almost invariably insufficient for retention of the crown. (Fig. 2.) The post should be of round iridio-platinum wire, 14 gauge for centrals, cuspids and molars; 16 or 18 gauge for lower centrals, laterals and bicuspid. Having enlarged the canal sufficiently, the tooth is now trimmed down to the gum margin at the interproximate points, leaving the surface as nearly horizontally flat as possible. If, however, the root should be so thin or curved as to prevent enlargement of canal, the root must be left projecting above the gum on the lingual side a sixteenth of an inch, as in such case we must place more dependence upon the band for retention than usual.

After having cut down the root to the second point, the enamel is removed from the sides of the root, and the latter will project

above the gum sufficiently to permit of easy measurement and preliminary adaptation of the band. This would be a far more difficult task were the root cut down to the gum margin before the measurement and preliminary fitting. The band, which should be of pure platinum, 28 gauge, and soldered with 40 per cent platinum solder, having been adjusted and the gingival edge of it carefully trimmed to correspond with the gingival contour of the gum, is then removed and the root cut down the thirty-second of an inch below the gum margin at the interproximate points, the lingual half of the



Fig. 1.

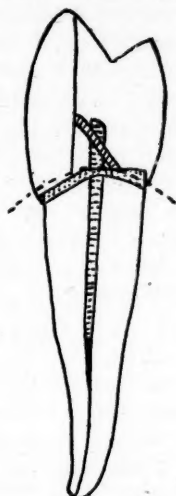


Fig. 2.



Fig. 3.

Fig. 1—The preliminary preparation of the root, the upper dotted line representing the point to which the root is first cut down, the middle solid line the second point and the lower dotted line the third.

Fig. 2—Diagrammatic illustration of a complete crown, showing the relative proper length of post, proper width of band, method of adjustment of facing and position of the pins. The dotted line represents the gum margin.

Fig. 3—Showing the root as finally trimmed.

root still being ground as nearly horizontally flat as possible, while the buccal half is cut down to the gum line. Then the buccal half of face of root is trimmed down slightly below the gum margin with sharp broad chisels. (Fig. 3.) It is impossible to do this with any of the abrasive wheels without mutilating the gum tissues severely, but by the careful use of chisels it may be done without wounding the gum or causing even the slightest hemorrhage. The

reason for so trimming these roots will be given a little later on. The band is now placed upon the root again and the contour of face of root traced on the inside of it by means of a sharp-pointed instrument, suitably curved to reach all points. It is then removed from the root and cut down to traced line, and again readjusted in order that we may be sure it requires no further trimming.

We are then ready to solder the cap to band. This cap should be about 32 gauge pure platinum soldered with 30 per cent platinum solder. It is not difficult to adjust and solder the cap to the flat section of the band. The surplus of cap extending beyond the band is cut away with fine scissors, the band is readjusted to root, and the buccal flap of the cap burnished into contact with the buccal section of the band. (Fig. 4.) This method is absolutely accurate and eliminates all danger of springing the band out of place. The cap is now removed and the buccal half soldered to the band, and then placed upon the root once more for a final fitting. There should be no portion of the root exposed; the band should extend below the free margin of the gum at all points, but not more than a thirty-second of an inch. There is a tendency among the majority of the profession to extend the band altogether too far beneath the free margin of the gum and to impinge in many instances upon the pericemental membranes, causing extreme pain during the adjustment of the band and in the final setting of crown. As a result the crown never feels comfortable, and in a short time an irritated condition may be noticed, leading to a progressive inflammation which results in recession of the gum, and oftentimes even far more serious results.

If all proper precautions have been taken there should be absolutely no pain when the band is placed upon the root this time. The cap is now perforated with a sharp, tapered instrument, or a cone bur, at a point directly above the enlarged root-canal. A suitable post of tempered round wire having been prepared, it is grasped firmly in a pair of pliers and *forced* through the cap to its place in the canal. The end of the post which projects above the cap should be square, so that it may be readily and accurately replaced in the impression. Frequently the cap and post may be removed from the root without disturbing their relative positions. If so, do it and solder the post to the cap with 20 per cent platinum solder.

If the post and cap cannot be removed from the root without dis-

turbing their relative positions, a small mass of softened modeling compound pressed down upon them while in place will serve as an impression in which they may be placed inverted. The inside of cap is then filled with investing material, allowing it to extend well up on the root. As soon as this is set, remove from the modeling compound impression, dry it slowly, and then solder post to cap. This soldering should be done before the bite and impression of the case are taken, as very slight disturbance of the relative position of the post and cap may quite ruin the crown. The bite and impres-

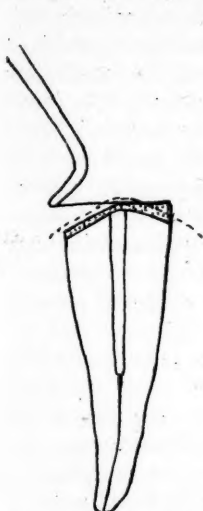


Fig. 4.

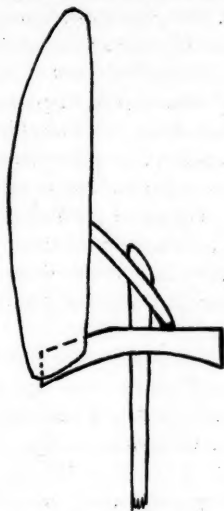


Fig. 5.

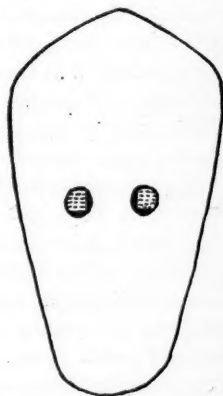


Fig. 6.

Fig. 4—Illustrating the adjustment of the cap to the band.

sion are taken at one and the same time in modeling compound, care being taken that the patient brings the molars and bicusps into proper occlusion, instead of merely bringing the incisors edge to edge, as they are extremely apt to do. Taking a bite and impression in modeling compound at the same time may seem a rather careless method of doing things, but with care exceedingly accurate results may be obtained.

The impression having been taken, the cap and post are carefully replaced, if they do not come away with it, and the inside of cap is filled with wax, carrying it a short way up on to the post, the

remainder of which is oiled. This is done so that the cap may be removed from the model after it has been run up in plaster. A slight amount of heat will soften the wax so the post may be grasped with a pair of pliers and the cap readily removed. The wax is then burned or boiled out. The cap can be removed from and replaced upon the model at will and more conveniently than in the mouth. In fact, it is necessary in the construction of porcelain crowns that one be able to do this, for the case must be tried upon the model from time to time to verify the work. The articulated model with the cap in position having been obtained, a suitable facing is selected.

As regards color, frequently more artistic results can be obtained by matching the same tooth on the opposite side of the mouth than the adjacent teeth. For instance, the cuspids as a rule will be found slightly differing in shade from the bicuspid or laterals. When this is the case the shade should be taken from the cuspid upon the opposite side of the mouth instead of endeavoring to match the teeth adjacent. The same is true of the bicuspid, and occasionally of the laterals and centrals. Having obtained a suitable facing, it is ground into contact with the buccal edge of cap, allowing the facing to extend over edge of cap about a thirty-second of an inch. (Fig. 2.)

This will leave a little V-shaped space between the end of facing and band, which is to be filled in with porcelain body. (Fig. 2.) The writer prefers this method to the one formerly followed, of cutting out the gingival end of facing so that it will extend up over edge of band. (Fig. 5.) This is a difficult operation, consuming considerable time if done properly, and resulting in a thin veneer of porcelain over a metallic surface, quite apt to bleach out or crack in soldering and more especially in fusing the body. If the root be cut down below the buccal gum margin, as has been advised, the first method will eliminate these two liabilities, will be found an easier method of adjustment, and will yield fully as artistic results, because the edge of facing being beneath gum margin, the V-shaped piece of porcelain baked in is wholly hidden from sight.

The pins are bent down as nearly as possible into contact with the cap. They are slightly flattened on the bottom side, and also upon the sides where they will come in contact with the post. (Fig. 6.) This is done to give contact over as great an amount of surface as possible. The facing is waxed in with as little wax as is necessary

to hold it, and is then slipped off the model and invested in material composed of plaster, two parts; fine shredded asbestos, two parts; powdered silex, 1 part. As soon as the investment is hardened the wax is removed by softening it slightly with dry heat, picking it out with instruments, and dissolving what may be left with chloroform. The author believes that investments are stronger and will stand the high heat necessary for soldering with less shrinkage or cracking if they are not subjected to the influence of boiling water or moisture of any kind in removing the wax.

Both pins are now grasped with a pair of pliers and pinched into close contact with the post; at the same time, if possible, they are forced down to actual contact with the cap. If the wax had been boiled out of the investment, it would have left it in such softened condition that this bending of the pins would have certainly displaced the facing. It is most essential that the pins be bent in and down into contact with the post and cap, or as close to the cap as possible, for two reasons: First, because it unites more firmly together the various portions of the metallic structure; and second, because we must secure as great a bulk of porcelain as possible, endeavoring to obtain as thick a section as possible over the metallic structure, especially at the point of articulation, and carefully avoiding all thin veneers of porcelain where any stress may be brought to bear. The joints between the pins and the cap are fluxed with a saturated solution of borax; minute pieces of pure gold plate are placed at the fluxed points, and the case is put upon the Bunsen burner.

As soon as full heat is obtained from this source, the large flame from the blow-pipe, which will envelop the whole facing, is now turned on. The heat is carried up until the gold fairly dances around the joints, and is maintained there for a period of half a minute. If the minimum amount of gold has been used, as it should be, and the heat has been carried to the proper point and maintained there long enough, no trace of gold can be noticed when the case is removed from the investment. It is not necessary to flux the joints, as neither the metals nor the solder are oxidizable, but it is done because the first application of heat so acts upon the flux as to pin the gold solder firmly in place, so that there is no danger of the blast of the blow-pipe dislodging it; and second, because the gold has a tendency to confine itself to the region fluxed; but bear in mind

that pure gold must not be used as a solder except when the parts are in actual contact. The man who is foolish enough to attempt to jump joints or fill in crevices with pure gold, and then use any of the high fusing bodies afterwards, is simply inviting failure.

Pure gold is used in soldering the pins to the post and cap because it being comparatively easy to secure actual contact between these structures, there is no danger of their becoming unsoldered in the application of the requisite heat for fusing Close's body; but more especially to avoid the necessity of carrying the heat so high as to bleach out or alter the delicate yellow shades in the necks of the teeth. If the facings discolor at all it is usually at that point. In passing, I may say that the yellow shades bleach out slightly in the fusing of the porcelain, while the color is intensified in the greenish and bluish grays. After removing the case from the investment, all sharp edges and points are carefully rounded off, and any surplus portion of pins or post cut away. The cap and band are roughly polished with coarse sandpaper discs, leaving clean surface of platinum, slightly roughened, to which the porcelain body seems to adhere more firmly after fusion than it does when the band and cap are highly polished.

The case is then put upon the model and the articulation of occluding cusp and its relation to facing of crown carefully noted. The post is now fixed in a small pin-vise, and Close's body, finely ground, is mixed to a comparatively thick paste and worked in around the pins and post and between the facing and cap. The crown is jarred from time to time by tapping the pin-vise, which brings the moisture to the surface where it is readily absorbed by napkins. This must be done or the moisture in evaporating from the interior of the mass will leave air bubbles. The crown should be overbuilt with body at all points, as there will be a shrinkage of about 10 per cent in fusing, and even if there be a surplus it is much easier to grind off than to bake on a small thin section of porcelain, which it would be necessary to do were the body merely built to the edges of facing and cap. These small thin sections of porcelain are very difficult to correctly fuse and frequently crack off from the main portion of the crown.

Having built up a rough outline of the tooth with a slight surplus at all points, and having removed all moisture, the grinding surface where we wish to carve sulci and build up cusps and ridges

is slightly moistened with a sable brush. This surface moistening is necessary to prevent the body from crumbling under the instruments; sulci and pits are carved out with delicate spoon excavators and spatulas, while the cusps and ridges are built up with delicate sable brushes. This done, the case is dried, removed from the pin-vise, placed upon a fire-clay or pipe-clay support, and inserted in the electric furnace.

One who has an electric current available should most certainly equip himself with one of these devices, for it is the only means of accurately fusing porcelain bodies. One must test his furnace carefully, however, by baking little buttons of porcelain in it before attempting to fuse a practical case. Furnaces of the Custer type give the most uniform distribution of heat, but are the most difficult to repair; while furnaces of the muffle type, such as the Peck and Downie, while comparatively easy of repair, have a very unequal distribution of heat. A bridge which would occupy three-quarters of the length of the muffle would be found overfused in the center if both ends were fused, or if fused to a nicety in the center would be found to be little more than biscuited at both ends. The same is true of full continuous sets.

There are various ways of ascertaining when the body is fused. One is by running the furnace a given length of time, but this is somewhat inaccurate, because the voltage of city currents is a variable quantity, and it takes but slight variation to affect a furnace one way or the other; while one is quite at sea if one wishes to bake a second case before the furnace has cooled down absolutely after baking the first one. Another method is to place a small cylinder of gold where it can be seen from without, running the furnace a certain number of minutes and seconds after this gold pellet has melted down.

In regard to the length of time which should elapse before fusing of the porcelain, it is immaterial whether the case is fused in ten minutes or half an hour, and the same in regard to cooling it off. The writer has never been able to note that porcelain which was given half an hour to fuse and half an hour to cool off was any tougher or stronger than that which was fused in ten minutes and cooled off in another ten, providing the heating and cooling were done in a gradual manner, so as to avoid checking. The case having been fused and allowed to cool is then tried upon the model

again, and the surplus cut away with any of the abrasive wheels, followed by polishing with the sandpaper and cuttlefish discs. This precaution should always be observed if carborundum wheels are used in grinding the case down and it is intended to fuse it again. If one neglects to do this he will find a discolored spot on his porcelain after the second fusing.

The case having been verified by trying it upon the model, is then ready for trial in the mouth. If every thing be found correct the crown may be set with gutta-percha or cement. It is very convenient to be able to remove a crown quickly without mutilation in case of accident. The writer accomplishes this by simply painting the post and under side of cap with a thin film of sandarac varnish, which is allowed to thoroughly harden, and the crown is then set with oxyphosphate cement. This gives a perfectly secure attachment for the crown; and if it becomes necessary to remove it the adhesion between post, cap and cement may be broken up by the application of heat, which softens the thin film of hard varnish, and allows the operator to readily remove the crown. Before the crown is finally set, however, the gingival border of band is trimmed down to a thin edge and highly polished with cuttlefish discs. It is best not to do this until now, as in the handling necessary this delicate edge might be bent or torn. It is quite essential that this be done, however, for the welfare of the margin of the gum, but unfortunately it is often neglected. In fact, the marginal edges of most crowns may be found duplicated on almost any old tin can. The gingivitis noticed in the gum about so many of the crowns is due almost as frequently to the condition of edge of band as to the faulty preparation of root and the ill-fitting bands that result.

Occasionally it will be found necessary to grind the front of a facing to secure an artistic result. The facing may be quite suitable for the case so far as size and shade are concerned, and yet the face be too convex as compared with the labial surfaces of adjacent natural teeth. This convexity must be removed or there will be an indefinable, unnatural appearance to the crown. This grinding ruins the enamel surface, but it can be restored by polishing this surface, after having cut it down with any of the abrasive wheels, with coarse and then fine sandpaper discs, followed by cuttlefish discs. After the body has been applied to the case and just before inserting it in the furnace, paint this ground and polished surface

with a film of thin liquid silix. The enamel surface will be found perfectly restored after the porcelain has been fused.

If you have occasion to grind the porcelain crown with carborundum or any of the abrasive wheels after the first fusing, they should be used dry, the dust blown out of pores of porcelain, and the surface carefully dressed down with sandpaper and cuttlefish discs. If this precaution is not followed there will be a spot of discoloration on the porcelain body at that point after the second fusing. This discoloration is said to be due to the oxid of aluminum, which is one of the components of carborundum.

Use distilled water in mixing the body, especially if the water supply be fed by a spring, as there are generally minerals in solution which will be very apt to discolor the porcelain body. All the coloring materials used in tinting porcelain are metals or rather metallic oxids. The workbench should be carefully dusted off with a damp cloth before putting on the porcelain body. The fine gold and platinum fillings scattered about every dental bench usually contain some minute particles of iron from the file. This dust, if mixed with the porcelain body, will discolor it red or blue-gray, as it is gold and iron or platinum that predominates in the fillings. Covers should be placed over the work if left for a few moments.

Peculiar artistic effects may be produced by means of Dresden porcelain paints. I find these are much superior to the French "Lacroix" colors. The effect of gold fillings may be produced by grinding out a section of porcelain at the point where you wish the filling to show, and filling this in with Marsching's gold paste, inserting the crown in the furnace and heating it up to the melting point of gold. We will then have a mass of gold fused on to the porcelain which may be polished and burnished.

This matter may be thus summed up: The retention of crown is to be secured primarily by the size and strength of post; secondly, but to a much less degree, by the band; and thirdly, by the shape given root. The band should be as narrow as possible, as it is easier to perfectly adapt; its function is mainly to prevent splitting of the root, and to give us a joint between the artificial and the natural removed from the deleterious action of the fluids of the mouth.

The advantages of porcelain crowns are that any peculiarity of articulation or irregularity of arch within reason can be successfully provided for. It can be contoured and carved at will. There is no

backing of facings. There are no crevices to become discolored. No cracking off of facings. No tedious polishing.

In regard to the strength of crowns, the author was surprised at the resistance discovered in testing two typical crowns, a bicuspid and a molar, constructed as if they were practical cases; the tops and bottoms were dressed off flat, and they were tested in a standard crushing machine. The bicuspid did not crack until over a thousand pounds pressure was applied, and crushed only upon the application of about sixteen hundred pounds, while the molar did not crack until a pressure of a little over seventeen hundred pounds had been applied and crushed when twenty-two hundred pounds was applied. Inasmuch as the average pressure of the human jaws is only one hundred and seventy-five pounds, it must be admitted that the average porcelain crown is of more than sufficient strength to meet the demands that may be exerted upon it.

The disadvantage of this crown is the inherent tendency of porcelain to cleave upon the application of concentrated force suddenly exerted at a certain angle, but patients should always be cautioned that they cannot with impunity subject porcelain crowns to the abuse they do their own teeth without suffering for it.

Occasionally a minute crack will be found in the porcelain facing after the crown has been completed, and while it quite ruins the artistic effect, the crown is not materially weakened. This crack may be readily disposed of by drying the crown thoroughly with alcohol and dropping it in liquid albolene, allowing it to remain there about five minutes. It is then removed, washed with soap and water, dried with alcohol, and no trace of the crack can be seen. The liquid albolene is of such thin consistency that it readily penetrates the fine crevice, and under the moist conditions of the mouth will never be evaporated.

Discussion. Dr. J. L. Young: Many failures in porcelain come from unwisely selecting the cases. One of the important points about all crown work is to properly shape the roots, and I believe the diamond disc is very satisfactory for that purpose, also a cross-cut bur. I make all bands of iridio-platinum, 28 gauge, instead of platinum, and the after-polishing and trimming make it thinner.

Dr. Nyman: I agree with the remarks about diamond discs, but

am opposed to sandpaper, and have never been able to use advantageously a bur of any kind in the preparation of a root. I should as soon try to fit a band of sheet steel to a root as one of 28 gauge iridio-platinum. Pure platinum, 29 gauge, is very much like 22 karat gold plate, and is certainly strong enough to prevent splitting of a root. It can be much more accurately adapted than one of iridio-platinum, and we need accuracy in bands fully as much as strength.

Dr. Long: I do not see the need of making models, as the work can be well done without, nor can I understand why the essayist uses flux.

Dr. Nyman: Porcelain crowns can be made just as fast with models as without, and much more accurately. It is impossible to tell the exact situation in the lingual aspect when the patient closes the teeth.

I distinctly said that while a flux in soldering the joint was not a necessity, it was a great convenience, because a very slight application of heat caused the flux to attach the solder firmly to the joint, so that there was no danger of the blast of the blow-pipe dislodging it, and because the solder itself in flowing would be more apt to confine itself to the fluxed surfaces.

EMPHYEMA OF THE ANTRUM.

BY C. B. ROE, D.D.S., BUCHANAN, MICH. READ BEFORE THE MICHIGAN DENTAL ASSOCIATION, AT PORT HURON, JULY 11-13, 1899.

Taking it for granted that we are all familiar with this cavity and its surroundings, I will proceed. 1st. As to the cause of empyema in this region. It is usually brought about by caries of the teeth, catarrhal inflammation, violent blows on the face, nasal inflammation or by suppurative degeneration of cysts of the antrum, often resulting in periostitis, otitis and abscess of the upper jaw.

Of the teeth which are most apt to produce this difficulty by decay the region of the upper first molar is taken as the offending part, and through the bone at this point openings are most often made into the antrum for drainage, thus reaching the most depending point of the cavity. In case of edentulous mouth the opening should be made with care, for the lower plate in such cases is thin and the drill is liable to go so far up as to do serious damage to the other walls of cavity.

The size and position of the antrum is variable. In youth the walls are heavy while the cavity is correspondingly small. In mature life the opposite condition is met with to a greater or less extent. The position is governed a great deal by the size and shape of the bones surrounding it. It is also found very near the median line, with only a very short canal connecting it with the middle meatus of the nose, the opening into which varies in size from that of a probe to a finger, or it may be so far back that the extended roots of the second and even the third molars may penetrate its floor, being covered only by the mucous lining of the cavity.

During the fourth week of my practice, Mr. H. presented for treatment of an upper left central, which was badly broken and to all outward appearance was abscessed. I worked through its root-canal with a coarse broach and found no bottom to the cavity, but pus of a dark green color and with a very foul odor came away freely. I at once removed the tooth, and on passing a probe up into its fossa found that the end of probe was visible in the nostril. This led to investigation, and I learned that the patient had a peculiar dropping on the back of tongue, which he claimed "smelled like —." He had at times a very severe headache which was generalized over face on the one side; teeth all seemed "on edge," with general soreness; often noticed an offensive odor when blowing his nose. These symptoms were periodical, arising and then subsiding.

Here I might mention that this is one point which distinguishes empyema from ozena—the patient is always aware of the fetor, which is never the case in ozena, according to Briggs, and further, the pus in empyema is jelly-like, green, and with the most foul odor that mortal can conceive.

Electricity assisted us greatly in making our diagnosis; progress of the disease had been very gradual and until recently had given little inconvenience. There was a hyperemic condition of the parts involved, soreness and pain giving the first alarm. Little or no expansion of the bone had taken place, on account of there being almost sufficient drainage through the nose and central incisor fossa. Often the bone does expand and the cheek is pushed out, the eye protrudes and the lachrymal duct often closes, causing "weeping eyes."

I now extracted two carious teeth below the antrum and pierced

its floor with a good-sized drill through the fossa of the lingual root of the left upper first molar. This afforded perfect drainage and for a time was sufficient. The green pus came away freely. After thoroughly washing the cavity with warm sterile water I applied hydrogen dioxid, followed by an antiseptic and by sedative washes. To keep the opening clear it was necessary to put in a thin gold tube, which I attached to a gold band on the second molar. The patient was instructed to insert a cotton plug during meals to prevent food from packing into this opening.

With perfect drainage came rapid improvement, and in about nine months the cavity was closed and entirely healed. Cases have taken one, two and even three years for complete recovery, so I consider that this patient was fortunate.

Discussion. *Dr. C. H. Oakman:* I have found a tube in these cases very cumbersome, and when inserting it you cannot always tell how it will lie in the antrum. If the tube be too high it is impossible to get perfect drainage. To irrigate the antrum frequently with warm water is most excellent treatment. Peroxid of hydrogen is probably valuable, but neither it nor bichlorid of mercury should be used the first few weeks the antrum is open, especially when there is much pus. Both are not only coagulants but irritants, and a strong irritant in the antrum produces an excessive flow of pus. After using bichlorid in one case and causing great pain to the patient, I tried a two per cent solution of carbolic acid and in an hour had completely soothed the inflammation. Dr. Roe seems to doubt that cases can be cured in three weeks, but I think it very probable if proper treatment be employed.

NECESSITY FOR REMOVAL OF TARTAR.

BY F. B. SPOONER, D.D.S., BROOKLYN.

In the various journals I notice methods multiplying for treating disease of the teeth, but there is little said of prevention. Papers are read in which we see—"First apply the rubber-dam," but never "First remove all calculi from the teeth." Yet it would seem excellent advice to facilitate the application of the dam, if for no other reason. We read volumes on gold filling, the primary object being to get smoothness, all overhanging edges avoided. Then why not remove all tartar from teeth not decayed, as this deposit is all roughness.

Nothing is more important than that the teeth be kept free from this deposit. In fact we know that tartar is more hurtful than caries, for we see that there are teeth, especially in the aged, so dense as to resist all attacks of caries, yet they finally succumb to tartar. In time a germicide may be found that will prevent caries, but nothing will be discovered to defeat tartar, unless we can stop the normal action of the glands. Tartar will be always with us. It has been found on prehistoric remains and will be with the coming man when crown and bridgework have passed with an age so ignorant as to lose their teeth.

Salivary calculus must be fought as a most dread evil. It clings to and lodges between the teeth, favoring decay by impeding the dislodgement of the food through normal action of tongue and saliva. It penetrates under the gum, causing recession and rendering them sensitive to heat and cold.

Scaling is given too little attention in daily practice. I judge the reason is that "cleaning" is the term applied to the operation, a small word for a large thing. This is the fault of the dentist for countenancing such an appellation. We would not speak of "cleaning" out a bullet, or of "cleaning" out a spur from the nose septum; yet to reach down, and by delicacy of touch detect the scale in the gingiva, requires as much skill and certainly takes more time.

I often have patients ask, "What shall we do to preserve the teeth?" My answer is, "Have them *scaled* at regular intervals, and then *clean* them yourself with a brush." No brush will remove tartar; except to a limited extent it will never go between the teeth. Where calculus is under the gum, use of the brush is a positive injury, as the sharp edges of the tartar wound and bleeding takes place. This condition is easily recognized; the red and swollen gums show plainly to the experienced eye what is beneath. If a scaler be passed under the gum the lime deposit comes away like breaking glass. Nothing shows such magical change as that which takes place when this tartar is removed. But what a frail thing is a brush to remove this tenacious substance that takes steel and strength.

There is another charge to be laid to tartar—it is porous and becomes impregnated with decomposing matter. Though no decay be in the teeth, it is a rank offense, tainting the breath with the odor of putrefaction. No brush can remove it and no mouthwash disguise,

except for a time. How many know this when they use brush and floss silk, thinking they have complied with all the rules of cleanliness?

How many women know the reason or wonder at the omission of the good-by kiss in the morning? How often is an offense charged to tobacco when it is mostly tartar? How many good, estimable people know what a trial they are to those with whom they come in contact? Is it not our duty to tell them of it, for we have the privilege of doing so without offense, and it is therefore a responsibility. We can say what others cannot to their dearest friends, and by so doing we can benefit the individual and society. It seems our duty to tell them that brushes, floss-silk, or antiseptic washes are only gentle means, while the evil must be attacked at its source. The tartar scaled by steel and strength at regular intervals (according to disposition of individual) is the only radical cure.

PROXIMATE FILLINGS IN BICUSPIDS AND MOLARS.

BY J. L. SWEETNAM, MANISTEE, MICH. READ BEFORE THE MICHIGAN DENTAL ASSOCIATION, AT PORT HURON, JULY 11-13, 1899.

There is a great difference of opinion and practice regarding the proper formation of cavities in the approximate surfaces of bicuspids and molars. Some contend that no more sound tooth substance should be sacrificed than is necessary to retain form; and other scientific and progressive men insist that free margins must be given to such fillings, notwithstanding the necessary sacrifice of some sound structure.

In all filling operations upon the proximate surfaces the operator should have a broad intellectual comprehension of the basic principles of the cause of caries and its mode of aggressive attack. While the theory of free margins and retention of the interdental spaces has nothing particularly new about it, having been brought before the profession from time to time for the last twenty years, it has been placed upon such a scientific basis that we are forced to give it consideration.

While Dr. Marshall Webb was one of the finest operators of his day, and as early as 1882 called attention to the importance of free margins and due regard for the interdental space, he put it on the ground of expediency, as something ideal but not to be generally

practiced. It needed a Dr. Black to say that it was imperative and a Dr. Williams to demonstrate why.

Take a very common case of decay between the first molar and second bicuspid. At the point of contact we find caries has progressed to a considerable extent, although the teeth still retain their natural form. After opening up the cavities in this form we find that the buccal and lingual walls of both teeth are strong. Here is where a difference of opinion and practice arises. We will suppose that the carious portion of the tooth has been thoroughly removed and the cavities left in this form have been filled; in the great majority of cases a new carious condition will be found inside of two years.

If "extension for prevention" is adopted the danger points will be invulnerable. Many of our best operators practice this method and it is what all should do. There are those who contend that this portion of the sound tooth substance should be allowed to remain, but if it is, a vulnerable point is left and trouble will ensue.

Restoration of the contour of a part of the crown of a tooth signifies the building out of the filling material to the line that defined the figure of the tooth originally, and this may be done and still leave a most uncomfortable situation, if the form of the interdental space is not taken into account. I therefore lay great stress on the importance of the form of that space, and the form of tooth or even its full occlusion is of less importance, though not to be neglected.

I here illustrate a case that will show how food can wedge between the teeth. Even if free margins were made in this case we should still have a bad state of affairs, because the interdental space is filled up. Now I show the same case after being properly filled with the use of the separator. Here we have the interdental space restored, and with free margins caries will not again attack those surfaces and a comfortable situation is assured.

I have heard men say they had no sympathy with separating teeth; that they could fill just as well without. Perhaps they can plug the cavities after a fashion, but what will be the result? A case presented itself a few weeks ago, where the bicuspid was hard to get at and yet it had been filled without separation. Of course it was very uncomfortable and the patient changed dentists, falling to my lot. The natural contour of the bicuspid was restored and the interproximate space formed by me, giving the patient relief. In

extreme cases it is often necessary to separate by slow means. These and irregular teeth are the only ones in which I find it necessary to use wedges of any sort.

In all composite cavities in bicuspid and molars there are two important factors to be considered—the size and form of the seat of filling. A flat surface will stand the most direct crushing strain, so it is important to have sufficient surface to hold up under the great strain that these fillings are at times subjected to. The cavity should be well extended bucco-lingually, and the form of filling is no less important than its extent. There should be no slopes. At the cervical wall there should be a flat surface, a little farther up another step made to remove a slope at the line of the disto-lingual groove, and a third step in the central fossa, which adds strength and retaining form. This form will effectually bear any direct strain that the muscles of the jaw can exert.

In cavities of less extent there is a canting strain that must be guarded against. This can best be done by cutting broad flat grooves along the buccal and lingual walls. Pits or narrow deep grooves are not capable of bearing the strain and should never be used.

In the well formed dental arch the contact of the teeth one with another means that two convex surfaces being brought into contact, leave a V-shaped space between the tooth surfaces which in normal conditions is filled with gum tissue. The angle of these V-shaped spaces varies considerably, but the general principle remains the same. This interproximate space rounds out broadly to both the buccal and lingual embrasures of the interproximate space. The function of this space is to deflect the food in process of mastication so as to cleanse those surfaces yet not to retain any of it.

It should be the design of every dentist in operating upon approximate surfaces to so form that space that it will perform its function properly. The failure to leave a proper relation between the teeth will result in a most uncomfortable condition while such fillings do last and a sure failure in the near future. If food wedges into the interproximate space it soon destroys the arc form of the gum septum, leaving a depression of that tissue for a pocket to hold decomposing particles of food. In order to properly shape the interdental space it is necessary to press the teeth apart during the operation of

filling, preferably with a separator. All other methods of separating teeth require time, cause more or less pain, annoyance and soreness, but with a Perry separator the work is all done in one operation.

I prefer to use strips and disks in finishing filling, but considerable care is necessary in the use of disks that too much of the bell-shaped form of the filling is not removed. I so manipulate small disks at the buccal and lingual walls as to perfectly shape that portion of the filling, then with a narrow strip at the cervical wall I finish a form that is desirable in the interdental space, and with a fine disk smooth off the convex portion of the filling. Bur or any other suitable instrument may be used to finish the occlusal surface. When the separator is removed the two convex surfaces of the fillings should knuckle tightly together. As to how far down toward the cervical wall this point of contact may be, will depend upon the natural form of the teeth and to a certain extent on their occlusion with the opposing teeth.

SYPHILIS OF THE MOUTH AS IT INTERESTS THE DENTIST.

BY ANDREW P. BIDDLE, M.D., DETROIT, MICH. READ BEFORE THE MICHIGAN DENTAL ASSOCIATION, AT PORT HURON, JULY 11-13, 1899.

Though your field of work is limited to a portion of the buccal cavity, your field of observation is great in opportunity, for the mouth with its mucous surface and its vascularity, its numerous glands and its warmth, is a fertile ground for the propagation of disease. It often gives us warning of that which is to come, cautions us by the virulence of its contagious properties of the dangers of infection; and by retaining evidence of the disease long after the latter's disappearance from other external parts of the body, it again warns us that the malady still lurks in the constitution.

I have thought that in a discussion of the subject of syphilis of the mouth we are treading upon common ground. As a protection to yourself and especially to your clientele you should familiarize yourself with the nature of this disease, which affects the innocent and the guilty alike; especially so, as innocent inoculation covers such a large proportion of the afflicted, and as the lesions of the mouth are especially infectious.

I am naturally ignorant of the extent of your familiarity with the disease, but will refer briefly to syphilis in general, with the hope

that, even if statements well known to you are made, a reiteration of the facts will recall them to your memory and impress them thereon. The education of the dentist is so complete now that he is expected to master to a greater or less extent the knowledge of general medicine, especially in so far as it affects his own profession.

Syphilis is a chronic, specific, constitutional disease, both acquired and transmitted by inheritance; chronic in that its life history covers in its many manifestations an indefinite period of years; specific in that its cause can be ascribed to but one source, infection, presumably to the operation of the bacillus of Lustgarten; constitutional in that the general constitution always becomes sooner or later involved. With hereditary syphilis our paper has nothing to do. This virus gains entrance to the system through some local abrasion existing at the time at the point of exposure, or perhaps the virus by its own virulent force destroys the outer layer of the skin sufficiently to admit of its subsequent absorption.

Syphilis cannot originate *de novo*; it cannot occur in any occult manner. Actual contact must be had, and as through the genital organs is the usual method of exposure, the initial sore—the chancre, as it is called, which is the beginning of syphilis and whose presence always means constitutional syphilis, usually finds its abode here. With this you have no interest as dentists, except to know that no matter at what stage of syphilis in the offending party infection takes place, it must begin in the affected as a chancre; and therefore it forms a part of the history of the disease. From the time of exposure to the time of development of the chancre with the enlargement of the lymphatic glands in the neighborhood, all of which constitutes the first or initial stage, about three weeks intervenes.

Whatever may be the subsequent history of this initial sclerosis, a period of forty days must elapse before the symptoms of constitutional infection make themselves manifest. This gradual intoxication of the system is characterized by more or less pronounced prodromata, sometimes so mild as to escape the notice of the patient and at other times severe. A fortnight before the eruption complaint is made of malaise, lack of appetite, restlessness, insomnia, pain in the bones and muscles, more marked at night and especially along the shins; and of frontal headache, also more pronounced at night. Fever ranging from 101 deg. to 102 deg. F. may be present. All of

which produces a profound general alteration known as the syphilitic cachexia.

In the course of the ordinary evolution of syphilis the cutaneous lesions now develop; the second stage is ushered in and is manifested by a generalized, superficially-seated eruption, the syphilides, of many forms and extensive distribution. With these occur the changes in the scalp, eyes and mouth, in the latter of which our interest chiefly centers.

There is no difference in the pathological changes as they occur in syphilis in the mucous membrane of the mouth; but owing to the delicacy, warmth, moisture and vascularity of the soil, the clinical appearances are varied; the lesions are highly contagious, and on account of their exposed position are largely instrumental in transmitting the infection. They occur while the symptoms are present in no other part of the body; are more obstinate when present, and are liable to recur with greater frequency.

This infection takes place either by direct or mediate contact. The direct is more common and usually is through a prior solution of continuity of the epithelial membrane. As stated, the chancre most commonly appears upon the genital organs, but the extra-genital initial lesion is not uncommon. Through unnatural practices chancres occur upon the lips, in the mouth, or on the tongue and tonsils; or through kissing, innocently indulged in; or by a bite or an accidental tooth-wound; or through the rites of circumcision; or through dentists in their operation on the mouth of the syphilitic—so is infection carried.

By mediate is meant infection by means of objects which have come in contact with the secretions of the syphilitic, principally of the mouth. All syphilitic lesions belonging to the early or active stage of the disease, even the initial sclerosis, can transmit the infection by their secretions; but more so do the lesions of the mouth, and those around the vagina and the anus, the flat condylomata. The physiological secretions—milk, saliva, perspiration, tears and urine—uncontaminated with the syphilitic virus, are not capable of transmitting the disease; but as it is almost impossible to keep the former separable from the latter, it is safe to hold that all are more or less infectious, especially the saliva. Non-infectious also are the foreign pathological secretions, if unmingled with the luetic virus or blood; but the blood of the syphilitic, no matter how received, may

carry the disease. Thus through eating and drinking by knives, forks, spoons, cups and glasses; through household effects, by towels, handkerchiefs, clothing, pillows, toothbrushes; through pipes, chewing tobacco, cigars, cigarets, by medicines and candy passed from mouth to mouth; by uncleaned dental instruments; by court-plasters moistened with the syphilitic's saliva, is the disease passed from one to another.

In point of frequency we should expect that the lips would be the seat of the greater number of the extragenital chancres about the mouth; and so we find in Bulkley's table that among a total of 9,058 extragenital lesions 1,810 are on the lip and 1,504 within the buccal cavity as follows:

Lip	1,810	
Buccal cavity	734	} 1,504
Tonsils	307	
Throat (deep oral and nasal)	264	
Tongue	157	
Gums	42	

The initial lesion as it appears upon the lips and within the cavity of the mouth presents certain clinical features distinct from those of his genital confrere. On the lips it is usually seen more frequently on the lower than on the upper, and commonly appears at a fissure found on the vermilion border near the center of the lip; the base is red or grayish and the lesion marked by considerable size, sufficient to cause pronounced protrusion of the lip. Enlargement of the glands in the neighborhood must always be looked for.

The chancre of the tongue, situated usually on the outer half, is apt to be but little elevated, sometimes almost flat, and when at the tip has the appearance as if a piece of the tongue had been sliced off. Sometimes the under surface of the tongue alongside the frenum is the seat of the sore. A sharply defined induration is met with. The glands underneath the tongue are always enlarged and extensively involved. When on the tonsils there is considerable induration and more or less ulceration, with enlargement of the submaxillary glands and those of the neck. In the gingivo-labial fold, on the gums, the soft palate, and the mucous membrane of the cheek, the chancre is rarely met with and presents no distinct clinical features.

In regard to the pathological anatomy of the initial lesion, Bron-

son says: "The minute anatomy of the initial lesion does not afford a very satisfactory explanation of its peculiar clinical characters. The microscope plainly reveals a dense cellular infiltration with round nucleated cells, such as are found in syphilitic lesions at all stages of the disease . . . which cells are enclosed in a reticulated fibrous structure . . . At the periphery of the eroded surface of the syphilitic lesion the papillae are enlarged and infiltrated . . . but there is nothing in these facts to account for the dense hardness of the growth. To explain this characteristic and well-nigh constant accompaniment of the syphilitic chancre various hypotheses have been proposed."

Whether the syphilis has been ushered in by the genital or by the extra-genital chancre, the mouth shows a tendency to early symptoms, which, occurring here, are known as the mucous patches or plaques; for the purpose of study conveniently divided into the moist and dry (scaly) lesions.

Anywhere upon the buccal membrane, but usually at the commissure of the lips, and where the teeth come in contact with the tongue; and on the inner side of the cheek (especially, in my experience with the disease in its early stage), where the last molar infringes upon the gums, and in smokers upon the side of the mouth in which the pipe is held, or where the stem presses upon the dorsum of the tongue; where, in fact, the irritation is kept up, the plaque is found. It may be simply a circular or oval reddened spot, smooth and flat; though often raised above the level of the mucous membrane, irregular and numerous, and by coalescence of crescentic and wavy outline. In accordance with all inflammatory action there is at first the redness, dilation of blood-vessels, infiltration with embryonic cells and exudation of serum. This exudation contains the cells, which, deposited upon the surface, give to the patch the opaline appearance.

The tonsils are usually involved in early syphilis and are covered with an exudative, ulcerated membrane which closely resembles that of ordinary tonsillitis or diphtheria. It is likely to be of a persistent character, and so a tonsil that is covered with a membrane or ulcerated for any length of time should always excite suspicion.

The second group, comprising the smooth, dry, shiny and scaly lesions, may appear early in the life history of syphilis, but sometimes are delayed for many years. They are apt to appear on the

borders of or underneath the tongue during the first six to eighteen months of the disease; are especially persistent in character; are of infinite variety as to outline, and, when irritated, increase in thickness and dryness.

While anything resembling a chancre or mucous patch should put you on your guard, you must not be too hasty in forming an opinion, for great embarrassment may be caused by an innocent accusation.

The chancre of the lip does not usually offer any difficulty of diagnosis, especially on account of the tendency of the neighboring glands to be rapidly implicated. It might be confounded with cancer, but the latter always comes on the lower lip, is slow of development, painful, and though it lacks the hardness, may be denser, is irregular, of a wavy nodular border or ragged, and the glands in the neighborhood, when involved, have been gradually enlarging.

The chancroid or soft chancre is rarely extragenital and therefore need not be considered.

The chancre of the tongue must be distinguished from the ulcer of tuberculosis. The latter is usually associated with other evidences of constitutional tuberculosis, is painful, less indurated, though more irritable and inflammatory, irregular in outline, with a gray yellowish floor, of slower growth and more persistent.

The common ulcer or canker sore is difficult at times to distinguish. It is usually scooped out, very greatly inflamed, with a yellowish base, quite painful, especially if it comes in contact with the tooth or any material introduced into the mouth.

After the rapid administration of mercurials a slight stomatitis or mercurialism is produced, which results in ulcers that are severe, foul and painful, especially where the teeth press on the inner side of the cheeks, more especially near the molars. When severe the discharge of saliva is profuse and the tongue becomes swollen, and when protruded shows the mark of indentation; when extreme the mucous surface is raw from the removal of the epithelial layer.

The dry mucous plaque must be distinguished from the patches which are brought about by the continuous irritation of the smoker's pipe or weed; but it must also be borne in mind that the ordinary patches are aggravated by the same conditions, but are more apt to be hypertrophied and persistent and to recur with greater frequency.

The late lesions of syphilis are not of so serious a nature and so

need not here be considered; but these mucous patches to which your attention has been invited cover many years, at least a decade, during which the danger of infection is always great. Not only then by way of caution, but by the adoption of prophylactic measures, much may be done by you to prevent and to alleviate the distressing and dangerous symptoms of this disease as they appear in the mouth and to avoid the infection of others. The care of the teeth and the hygiene of the mouth are most important; especially in the active stage does the mouth require most constant attention. Every case so soon as it is seen, especially if before the outbreaks in the mouth have occurred, should be sent by the practitioner of medicine to the dentist to have teeth properly attended to, especially for the removal of all tartar and the care of decayed teeth, which by their presence excite the already inflamed gum, cheek or tongue. Cleanliness is of paramount importance. The mouth should be frequently washed out with an antiseptic, astringent solution, preferably of bichlorid of mercury 1.5000; or of permanganate of potash gr. 1 to the ounce; or of boric acid, though any other good wash will do. This will not only prevent the severe manifestations, but will permit a safer administration of the mercurials, upon which in the active stage of syphilis we must place our chief reliance.

Every fissure and erosion must be carefully watched, every patch viewed with suspicion. A different set of instruments should be used with all suspected cases.

Discussion. *Dr. T. J. Collins:* I think a study of syphilis, both theoretical and clinical, should be general in dental colleges. If one's observation is confined to the mouth it is very limited, and however great knowledge a dentist may have of the disease he is more handicapped than the physician, for he must confine himself to the mouth. In many cases the mouth does not present a typical lesion. Tobacco-chewing, hot and cold drinks, carious teeth, etc., all have a tendency to irritate, and the syphilitic lesion may present a different appearance from the typical. The dentist cannot have recourse to corroborative evidence. He may notice the falling hair and eruptions, but is prohibited from asking questions, especially with women, although the physician will be made a confidant. In all cases it would therefore be better to err on the side of safety. The essayist referred to tertiary syphilis as not so serious as primary, but I believe the dentist is in as great danger from one lesion as the other.

Digests.

TWO PRACTICAL POINTS. By E. H. Keith, D.D.S., Rhineland, Wis. Inquiry of students from various dental colleges regarding investing cases, where the anterior teeth are ground to rest against the gum tissue instead of having vulcanite at that point, convinces me that the method is practically the same in the different schools, that is, the student is taught to so invest the case that the anterior teeth will be held in the section of the flask in which they were originally placed. For several reasons it seems to me that this is unwise. In separating the flask for packing, in packing the case, and in finally separating the flask to see that the quantity of rubber is correct, it is almost impossible to keep these teeth in position. If they fall out of position small particles of plaster will be broken off and may become mixed with the rubber. The chances for a loose tooth being vulcanized out of position are also good. To avoid all this I let my plaster investment come just to the edge of the wax around the posterior teeth and to the necks of the anterior teeth. Then after completing the investment the teeth are drawn when the flask is opened and are securely held in the opposite side of the flask from that in which the investment was begun. In drawing the teeth in this manner none of them gets out of place, there is no broken investment to patch up, and no swear words to be chalked up against the operator. Then if the flask is brought thoroughly together before vulcanization, you need have no fear as to the success of the operation.

A cheap and handy bench block may be made by cutting a hard rubber ball into two equal parts and screwing one of the halves to the work-bench.—*Indiana Journal*, Oct., 1899.

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PERIPHERAL PARALYSIS OF THE HYPOGLOSSAL NERVE. Aug. Hoffman (*Nuerologisches Centralblatt*, Feb. 1, 1899) relates a case occurring in a girl, aged seventeen, who was also the subject of old disease of the middle ear. She had often suffered from inflammation of the glands in the neck, and four months before she was first seen had a severe attack, after which the glands did not completely subside. Three months later she noticed that the left half of the tongue was smaller than the right.

There was then some difficulty in speaking and chewing. When she first came under observation the left half of the tongue was small, thin and wrinkled. There was no disturbance of sensation and no interference with taste; there was no paralysis of the palate or larynx. The right side of the tongue reacted normally to the electric current, but on the left side the reaction was sluggish, with a preponderance of the anodal closing contraction. The glands in the neck were still enlarged, but they subsequently became smaller. There was no evidence of disease of the vertebræ. No real improvement was recorded after prolonged electrical treatment. The reaction of degeneration showed that either the trunk or the roots of the hypoglossal nerve were affected. There was, however, no reason to suspect either acute or chronic disease in the center. Cases have been reported in which large swellings of the glands of the neck have been the cause of lingual hemiatrophy. As the glandular enlargement was slight in this case, Hoffman thinks that the inflammation must have spread to the nerve rather than that there was any pressure on the hypoglossal nerve itself. In Erb's case there was an angina along with slight swelling of the glands. It is strange how so considerable a wasting of half the tongue should interfere so little with its movements.

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USE OF BINDING-WIRE IN THE APPLICATION OF RUBBER-DAM. By W. M. Gabriel, M.R.C.S., L.D.S. Eng. Few of the difficulties which confront the dental surgeon from time to time are more harrassing than the apparent impossibility of satisfactorily applying the rubber-dam in many cases where its use appears to be indispensable from the need of absolute dryness. Chief among such are mesial or distal cavities (especially in the lower jaw) extending at the cervical edge far below the gum. Often after one or two visits, at which careful filling with temporary gutta-percha has reduced the interstitial gum tissue to the level of the cervical edge of the tooth, the real difficulty begins. It is found that no matter how tightly or carefully a silk ligature be tied round the tooth, it is impossible to carry the rubber over the cervical edge or to retain it there. After a little reflection, however, it is not difficult to see how this trouble arises. It is comparatively easy to push the gum away between the teeth to almost any extent, but this is not the case with that covering the external and internal

alveolar plates. The consequence of this is that the gum margin assumes an irregular line, and the ligature—silk or such like—which like the rubber assumes, when taut, a straight line—fails to follow this.

For some considerable time past I have successfully overcome this by using, instead of silk, binding wire, twisting it up with pliers instead of tying. This can be easily pushed into position with a blunt instrument carrying the rubber before it, and will maintain its shape in a most satisfactory manner. I have used also a thicker binding wire in ordinary distal cavities when they happened to be situated in the last tooth in the jaw, the free ends left after twisting being bent and utilized to hold the rubber-dam away from the back of tooth. I have no hesitation in stating as my firm belief that often the power of excluding saliva and securing absolute dryness, or the contrary, may mean the retention or loss of a valuable tooth or root.—*Jour. of Brit. Dent. Assn.*, Oct., 1899.

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HOW TO MAKE BACKING FOR PORCELAIN FACINGS.

By Dr. Arthur S. Cooper, Baltimore, Md. Long and often have I rubbed my sore fingers, and have seen others do the same thing, after the process of backing up facings for crown and bridge work, especially after the tipping part of the process. Having arrived at an easier and more satisfactory method, those who advocate tipping facings, and more especially those who desire the backing to *fit*, may be interested in the following, the materials needed for the work being a moldine outfit: *First*. Grind facing to proper size and shape. *Second*. Cut backing a little too large all around; punch holes in backing for pins; cut pins off about proper length. *Third*. Take rather deep impression of back of facing in moldine composition. In removing facing with pointed instrument be careful to repair damage to impression caused by instrument. Cut common toilet pins into halves or quarters and insert two of the pieces in holes made in impression by pins of facing. *Fourth*. Place rubber ring around impression of backing and take cast of same. This will give a reproduction of back of facing, with long pins. *Fifth*. Place backing on cast and trim pins short; shape backing slightly with fingers; remove backing and place small piece of wax between pin-holes on under side and replace backing on cast—the wax will hold backing in place when cast is turned over. *Sixth*.

With piece of lead for counter die, proceed to stamp out a backing that will *fit* the facing. Make a joint in a Richmond crown between gold and porcelain above, with little or no burnishing. Make a tip on incisive edge that will require very little more work to complete.

In speaking of tipping facings, we have the teachings of those to consider who say that tipping facings increases their liability to crack; and others who have learned by experience that facings are not safe untipped. As the work of tipping facings is made easier and more accurate, I think the objections of the former will decrease accordingly.—*Items of Interest, Sept., 1899.*

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SOME RARER FORMS OF ABSCESES CONNECTED WITH TEETH. Read before British Dental Association, 1899. By J. G. Turner, F.R.C.S., L.D.S., London. The common alveolar abscess is outside the scope of this paper, but I must draw attention to the fact that it is not really an *alveolar* abscess—the term refers only to the common site of exit of the pus and is a very misleading expression. The roots of all the teeth in either upper or lower jaw reach well into the body of the bone, hence an abscess starting from septic absorption of dead pulp is an abscess of the body of the bone; or in the upper jaw perhaps abscess of the antrum. Two other anatomical points are worth remembering; the insertion of the buccinator into either jaw is of sufficient strength to direct the course of pus; and the roots of teeth vary in length.

An abscess formed round the apex of a tooth, after perforating the outer plate, may track a little way up beneath the periosteum and perforate on the side of the alveolus into the mouth; this is the common form. But it may have perforated the outer plate below the attachment of the buccinator, in which case it will first strip up a greater or less extent of periosteum, forming a subperiosteal abscess when the area stripped up is of any considerable size; then burrowing in the tissues of the cheek it will form a second pocket for itself, usually subcutaneously, after which it perforates the skin and opens outside. Or the pus may continue to burrow among the planes of connective tissue of the neck, forming a pocket wherever there is a large plane of tissue to be stripped up, until arrested by some firm, bony attachment where the final collection will take place and the abscess will open itself.

This external opening is dependent on the length of the tooth and the position of the attachment of the buccinator. It occurs chiefly in connection with the lower teeth, but I have seen it also in connection with a right first upper permanent molar; the periosteum of the jaw was stripped up over a large area, and there was a large subperiosteal abscess, from which was a small tract leading to a subcutaneous collection of pus, with two large pockets opening by two sinuses about half an inch below the lower border of the orbit.

So far we have as rarer forms, the subperiosteal abscess, interstitial abscess, and subcutaneous abscess. The first of these should be treated from inside the mouth. In opening it is a safe rule to keep close to the bone, the soft parts being stripped off the bone by the pus, and carrying important structures with them. They may be drained with gauze or drainage tube, and must be syringed frequently, *e. g.*, three times a day. I have successfully drained into the mouth a very large subperiosteal abscess situated over the angle of the jaw and requiring some two inches of drainage tube to reach it. Sometimes the subperiosteal and the subcutaneous abscess are so close one over the other that the incision made to open the subcutaneous will also open up the subperiosteal, which should then be treated from the outside. In this case the extent of the bone laid bare and its white color may seem alarming, but I have never seen necrosis take place. The bone still has its internal blood supply, and constant cleanliness will prevent infection from without. Collections of pus between the planes of connective tissue, or subcutaneous, must be treated from outside; they cannot be easily or safely reached from within, and when there are signs of suppuration an opening should at once be made. Hot fomentations and delay tend to increase the amount of pus and render an unsightly, adherent scar almost unavoidable, which early incision would probably have prevented.

The scar, which is often most disfiguring, should be released from the bone by a tenotome passed close to the bone either from inside the mouth or from outside, whichever is more convenient; and subsequently the parts should be massaged daily to prevent re-adhesion.

In all these forms of abscess, as also in the glandular, whenever they persist for any length of time, the tooth which originally caused the mischief may have become quite painless, being perhaps

cut off from the abscess and apparently healthy again; or, though there is still suppuration going on round its apex, yet painless owing to the formation of an external sinus; or the secondary mischief may persist after extraction of the tooth, especially in subjects of low vitality.

This remark applies particularly to the glandular abscess. This may form as a result of direct absorption from the original focus round the tooth, or from infection from one of the secondary collections of pus. The gland affected is usually a submaxillary or one of the higher superficial cervical glands. In the case of people of "strumous" diathesis, i. e., of low resistance, the gland may enlarge from but slight irritation, and break down long after the original tooth trouble has been forgotten. The acute glandular infection is in some cases the starting point of spreading cellulitis of the neck, a most fatal disease. The cases in which we should be particularly on the guard for this disease are those in which the glandular implication is very acute, and those in which there appears to be but little trouble around the offending tooth beyond some tenderness and infection of the gum, but considerable glandular trouble. In such cases I am convinced early incision will save life.

There are two other forms of abscess which I wish to describe; the one may be called the chronic abscess of the maxilla, *par excellence*; and the other is an abscess dependent on tooth remains, or on the healing over of an imperfectly drained septic socket.

The chronic abscess of the maxilla, when fully developed, has hollowed out the whole body of one maxilla till it is only a shell of compact tissue, remaining, however, limited to the bone of its own side; it opens by a small sinus over a tooth, usually incisor or cuspid, and though it may have perforated the bony shell elsewhere, e. g., in the palate, never has a second external opening; the discharge is thin and not profuse; there is little or no pain or tenderness; there is no bony enlargement and but slight swelling of the soft parts. The cavity is irregularly lined with granulation tissue. The originating tooth—by this time always dead—is indicated by the position of the sinus. If it has died as a result of caries there will be a history of one or more acute attacks, but if free from caries there may be no history of pain, and the patient may even be unaware of any abscess? The tooth will be found loose, from absorption of its socket, and a small steel probe will pass right

up to the apex. Pathology: There has been a destructive caries of the alveolus, spreading up to the apex of the tooth, started first by the deposition of a ring of tartar around the neck of the tooth, followed by the lodgment of food and *debris*, which has decomposed and set up a destructive caries of the alveolus. The process, once started, is self-supporting, more tartar and more *debris* taking the place of the destroyed alveolus, till at last the apex of the tooth is reached and the vessels nourishing the pulp are exposed to the attacks of the disease. These become thrombosed, the pulp dies, and the whole is readily infected via the apical foramen. From this point the disease spreads throughout the whole bone, reinforced by the decomposition of the pulp. The process appears to be slow infective caries of the bone, different in nature from the ordinary abscess of acute origin.

Obviously an abscess of such pathology may occur in the lower jaw, and I think I have seen it, but one with similar clinical features does not occur, since the shape and size of the bone do not lend themselves to it, and the periosteum of the lower jaw, if irritated, will deposit new bone, while that of the upper jaw appears to lose this function after about the age of sixteen, explaining why there is no bony enlargement in these cases.

This abscess must be opened, scraped, drained and syringed. During the healing there may be more pain than previously, often referred to the teeth, the nerves of which may be caught in the contracting cicatricial tissue. The tooth itself may be saved if firm enough, as the extraction of the one tooth does not go far towards destroying one of the bony walls, and an extensive cavity of this kind takes as long—several months—to heal after extraction of the tooth as without. An interesting point in connection with this abscess is that when an opening has been made into it, and the cavity is filled with blood or other fluid, the fluid can be seen to pulsate. This pulsation is communicated to it by the vessels in the walls of the cavity, and is analogous to a form of pulsation seen in bleeding, or oozing of clear fluid, from the external meatus of the ear.

The second form of chronic abscess occurs in both jaws, but is clinically more interesting in the lower. It depends on the presence of a small piece of the end of a fang, or on insufficient drainage after extraction of the dead tooth. This latter form I have

noted only in the lower jaw. When a very small piece is left in, it is well within the body of the bone; the alveolus closes over and is absorbed just as if the whole tooth had been taken out; and the same may happen after the extraction of a tooth whole, the source of irritation being some small piece of dead bone or small collection of pus cocci, which, harmless at first, have slowly multiplied and gathered strength until, from lowered resistance or other cause, they are strong enough to cause suppuration.

When this occurs in the upper jaw there is pain and tenderness, some swelling of soft parts, but no bony enlargement; the trouble may subside and recur again at intervals. If untreated the antrum may be involved. The nearest lymphatic glands may be enlarged. I show you here a small piece which, five years after extraction of the rest of the tooth, caused such an abscess, with subsequent involvement of the antrum.

In the lower jaw, as in the upper, the alveolus may be entirely absorbed, and there is pain, tenderness, and some local swelling, in this case partly of soft parts, but chiefly bony, involving the body of the jaw. Owing to the position of the inferior dental nerve, there is often, especially in the bicuspid region, severe neuralgia. As in the upper, the nearest lymphatic gland may be enlarged and tender. The neuralgia is caused by the abscess in its enlargement opening up the canal of the nerve, and I have in two cases satisfied myself that the nerve was actually at the bottom of the cavity.

In this case there is very severe, continuous, heavy pain, and the more acute shooting pain which occurs at intervals without any necessary regularity; it is set up by any irritation, such as cold air, movement of eating, etc.; it spreads in anatomical order to the other branches of the fifth nerve, first to the ear, then up the side of the head to the vertex, to the infraorbital nerve, to the supraorbital nerve, and down the neck. It lasts a varying time, from a few seconds to hours. It is unaccompanied by trophic changes, but there may be increased secretion of tears or saliva. It is confined to the one side and appears always to start from the seat of mischief. If the abscess has not involved the inferior dental nerve this neuralgia will be absent. In a case I recently operated on, dependent on a first molar, there was only a slight local pain, tenderness or swelling, but dull aching on using the jaw for eating, and one small gland was enlarged and tender; an abscess was found deep in

the center of the bone. No piece of tooth was found and all the other teeth were sound.

The length of time during which things may lie dormant varies greatly; therefore when a patient complains of pain or neuralgia starting in a spot where there is now no tooth, there may yet be a chronic abscess and the alveolus may be normally absorbed. Other points in diagnosis are: local pain and tenderness, with some swelling of the soft parts, and in the lower jaw some bony swelling; pain starting from one point—the seat of mischief (this I have hitherto found constant, but it may later prove not to be so), unilateral, and perhaps accompanied by increased secretion of tears or saliva; swelling of nearest lymphatic glands. A skiagraph should always be taken of doubtful cases.

The treatment consists in opening and draining; where the bone is thick and the site far back in the lower jaw, and in addition the soft parts very movable and bleeding freely, this is by no means easy. I have had a special trephine made with a heavy handle, to give steadiness, and with stout teeth have found it most useful.

In the after-treatment the cavity should be packed lightly and syringed at least twice daily. The lotion should be made with boiled water, and used in plenty. The mechanical cleansing of a good flow of water is most important. Very strong solutions of antiseptics cannot be used in the mouth without making it sore; 1 in 40 carbolic acid is the strongest permissible. H.Cl. is extremely painful when applied to inflamed surfaces. Formalin even in 1 in 100 solution may have disagreeable effects. I have seen a patient who had swallowed at the most 5 minims of the 1 in 100 solution become faint and nauseated, and though she was sufficiently restored by use of stimulants to go home, yet had a recurrence of some of the symptoms after arriving there.

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POISONS. By A. W. Harlan, M.D., D.D.S., Chicago. Read before Chicago Dental Society. A poison is defined as "A substance that destroys the functions of the various organs by action other than mechanical, endangering or arresting vitality." (Gould.) "A substance capable of producing noxious and even fatal effects upon the system, no matter by what avenue it be introduced; and this, as an ordinary result in a healthy state of the body, and not by a mechanical action." (Reese.)

Orfila has divided poisons into acrid, irritating, corrosive or escharotic, such as acids, alkalies, mercurial, arsenical, cupreous and antimonial compounds, cantharides, etc.; narcotic, acting on the brain, as opium, cannabis, hyoscyamus, piscidia, etc.; acronarcotic, acting on the brain, spinal marrow; irritant to the parts, aconite, belladonna, etc.; septic or putrescent, venom and virus from the animal kingdom. Then there are narcotics producing giddiness, headache, numbness, so-called destroyers of pain, like the newer coal-tar products, antifebrin, sulfonal, ammonol, acetanelid and nitroglycerin, trynitrin, etc.

For the purposes of the dentist a knowledge of the methods of treatment of such poisons as he may be in the habit of using daily is what is most needed. I well remember that many years since I painted the gum over the root of a large molar with tincture of aconite root (Fleming) and perhaps used more than I would now, and in two minutes my patient was poisoned. He became pale and clammy, commenced to give a dry cough, was cyanotic in a moment, fell limp and moist backward in the chair, and I was much frightened. Somewhere I had read that laudanum might be used in such cases. I gave him twenty drops and repeated it in a few minutes. Laid him out on the floor, gave ammonia by inhalation, used friction, and in thirty minutes he was all right. The books do not say anything about opium as an antidote, but I learned from this that it was useful. Digitalis, atropin, nitrite of amyl, hot water bottles, stimulants, are laid down among the remedies to be used.

We constantly use such agents as sulfuric, nitric, carbolic and chromic acids, zinc chlorid, silver nitrate, cupric sulfate, etc. The treatment for poisoning with such agents differs widely. For mineral acids use alkalies, soap, limewater, magnesia, potassium, carbonate of soda or chalk, milk of magnesia, plaster from the wall. The demulcents, slippery elm (acacia), gum-arabic, flaxseed tea, subnitrate of bismuth, morphin to prevent the shock, one-quarter to one-half grain, better one-quarter and repeat in fifteen minutes than to use all at once. Milk and albuminous mixtures are always soothing after such corrosives are used. All vegetable acids such as lactic, acetic, trichloracetic and the like are antidoted with alkalies and the demulcents, but in addition the stomach pump may be used and large watery emetics, like warm salt water, mustard water, etc. These are made better when they are made oily; the more

rancid they are the better. If anything will nauseate it is a salty, oily mixture of lukewarm water or mustard. (It must be remembered in these cases that there is no paralysis of the reflexes.)

Large volumes of water will dilute all mineral and vegetable acids, if nothing else is at hand which would be advisable to use.

Such poisons as carbolic acid and creosote, resorcin, and analogous coal and wood-tar compounds are to be met locally with vinegar, soluble sulphates, oils, lard, linseed or machine oil. Soap, lime (from the ceiling), saccharate of lime is better. One day (1875) I was injecting an abscess with 95 per cent carbolic acid and it squirted back over my face and into my eyes, blinding me for a time. I reached over to the operating case and emptied a can of machine oil into my eyes and smeared my face with it, and then groping my way to the sink I used soap as rapidly as I could and in about an hour I was comfortable and the next day was at work as usual. I spilled some acid by accident on a lady's face one day and at once used vinegar, and in two days no one would have known that 95 per cent carbolic acid had burned a space larger than a quarter.

Some accident may happen to you with nitrate of silver, but if the salt box is handy you need have no fear, as it will perfectly antidote it at once. In all cases it must be borne in mind that the demulcents and slippery substances should be used as protectives, for nature must have a chance.

Glycerin is not a good antidote for carbolic acid or creosote poisoning. Alcohol is not very useful, as it is only a solvent and causes them to spread, which is very bad and will frequently leave a scar. These agents coagulate to and through the Malpighian layer of the skin or mucous membrane and they must be antidoted quickly or there is much disfigurement.

Such agents as caustic soda, potash or sodium ethylate, which a dentist is likely to use, are easily antidoted by using vinegar, acetic acid, citric acid, lemon juice, orange juice, soft substances afterward, as white of egg, gruel, milk, barley water, olive, castor, sweet, or salad oil. In such cases it must be remembered that the system is given a shock which must be met by opium or quinin or stimulants, local or constitutional. Digitalis in small doses, $\frac{1}{100}$ gr., is good. Hypodermics of brandy or gin are good. It is not expected that we should treat anything but accidents, and not many will be found in an ordinary practice.

In all cases where it is suspected or known that a poison has been swallowed, it is necessary to use an emetic, save in acid cases, (like nitric or sulfuric) local or hypodermic. If the zinc salts are available, the sulphate is probably best (ten to thirty gr. in tepid water, or forty to fifty gr. of ipecac in powder). This is much better than the wine of ipecac.

Sulphate of copper is a good emetic but zinc or ipecac are better. Of this five to ten gr. in a half pint of warm water, to be repeated in ten minutes. Apomorphia is the most certain emetic, $\frac{1}{24}$ to $\frac{1}{10}$ of a gr. hypodermically. As the ebonite salvationist says, "It will move when all else fails." This may be repeated in fifteen minutes. (Once a dentist used the contents of a cuspador to produce emesis and it did well, after zinc and warm mustard and alum water had failed.) I would not hesitate to use anything to rid the stomach of a poisonous dose of any drug if the patient could be saved. All such drugs as sulphonal, antipyrin, ammonol, acetanelid and the hypnotics of that class are antidoted generally by using strychnin or digitalin; or the tincture of the above, $\frac{1}{60}$ gr. of the former and $\frac{1}{100}$ gr. of the latter, hypodermically.

In regard to opium and its alkaloids, the discovery of Moor, about three years ago, gives us a certain antidote when opium is taken into the stomach. After using the stomach-pump and emetics, about five to eight times as much permanganate of potash in water is given. This oxidizes the opium or morphin and renders it inert. If the morphin has been injected, the rectum and stomach are to be used for the antidote. Recently an overdose of opium was given to a child two years of age, and as the permanganate did not seem to act in the stomach, three ounces of a ten per cent solution were injected into the rectum and kept there by compression and the child recovered.

In case of poisoning by alkaloids in general per the stomach, it must be remembered that tannic acid is the best antidote, three to five times the quantity of the bulk of the poison being sufficient. Then inhalation of stimulants, warmth over the stomach, flagellation, movement in case of drowsiness. Coffee, hot and black, per stomach or rectum.

Cocain and eucain are poisons which many dentists are using daily. It is stated that volasem is the antidote, but I have not been able to obtain any, so cannot tell whether it is good or not. Amyl

nitrite, coffee and persistent use of ammonia, camphor and active motion I know to be useful, as I have had experience in that kind of poisoning.

For corrosive sublimate the best remedy is egg albumen, but in the absence of eggs blood is the next best (kill a dog or cat and get it that way).

If you should use aconite in a poisonous dose it is well to remember that atropin or even the tincture of belladonna or the liniment could be used to antidote.

Arsenic is so commonly used that it seems needless to say that iron (dialyzed) can be used locally and per the stomach. The hydrated sesquioxid is probably best. If iron is not handy, then magnesia in warm water, or milk of magnesia. (All poisons when taken into the stomach are to be ejected by means of emetics if possible.) Many of the corrosive poisons produce such a profound shock that injections of morphin are necessary to produce quiet.

In all the forms of narcotic poisoning an injection of twenty grains of caffein in a half pint of hot water into the rectum is advisable for a twofold purpose, as it takes the place of brandy or other stimulants and is more effective. Murrell says that a one per cent solution of nitroglycerin in alcohol, two to five minims hypodermically, acts as a great stimulant.

In chloral poisoning, coffee per rectum and strychnin hypodermically with heat, aromatic vinegar, ammonia acetate (liq. one-half to one oz.), mustard on the stomach.

In nearly all cases of poisoning by the various pain killers, liniments, headache powders and soothing syrups, a compound antidote is offered by Murrell as follows:

R	Saturated solution of sulphate of iron	100 parts
	Water	800 parts
	Magnesia	88 parts
	Animal charcoal	40 parts

The iron solution is to be kept in a bottle by itself and the magnesia and charcoal are to be mixed with water and kept in another bottle. When you are required to use this they are mixed and well shaken and administered in frequent doses of half a tumblerful at a time. This has no effect on alkalies, phosphorus, antimony or hydrocyanic acid. The latter is to be antidoted with emetics, stimulating inhalants and one-fiftieth gr. atropin, hypodermically, warmth, hot and cold douches, etc.

The iodine compounds are antidoted with starch, arrowroot, gruel, barley water, amyl nitrite, and morphin to relieve pain.

Mushroom poisoning has some domestic interest for all who have families. Emetics, castor oil one to two ozs. afterward, and either twenty drops of belladonna or five minims of one in fifty solution of atropin, hypodermically, and stimulants, as ether water, chloroform water, brandy, etc.

The various zinc compounds used by dentists are antidoted with potassium or sodium carbonate or washing soda, well diluted. All alkalies used as antidotes should be well diluted with water. Egg albumen, milk, slippery elm, and dilute tannic acid in water, morphin to control pain, one-half gr. hypodermically.

In conclusion I quote a recent definition of the legal aspect of poison by an eminent pharmacist as a basis for the classification of poisons in the forthcoming pharmacopeia: "Much has been said for and little against the proposition of the adoption of maximum doses in the next issue of the pharmacopeia. The opinion now prevails that this will be done, and no doubt such addition will prove of great advantage to physicians and pharmacists alike. If this can be done, why cannot the pharmacopeia also state what drugs shall be considered as of dangerous character based upon the maximum doses in which they may be administered? It can be argued that in the past it has been the distinct desire of the committee of revision to recognize only such substances as are of sufficient remedial value to deserve space in the pharmacopeia, and that there are a great many substances of poisonous character which have not been found deserving of such distinction. While this is no doubt true, it must be acknowledged that the committee have no need of precedents in order to add to or omit from their scope of usefulness, and if they deem it proper or necessary to separately or collectively define what shall constitute a poison, it certainly lies within their province to do so, whether all substances coming within that ruling are or have been otherwise officially recognized or not.

"In order to determine more clearly the sense of the preceding lines and to illustrate the idea set forth therein, a rough classification such as the pharmacopeia might adopt is appended below:
Class A. Hydrocyanic acid, compounds of antimony, arsenic, mercury (except calomel), silver, cyanid and sulphocyanid, nitro-ben.

zine, oils of tansy, croton, pennyroyal and savin. Phosphids, phosphorus, wood alcohol, cocain, chloral, apomorphin, aconite, belladonna, cotton root bark, conium, cantharides, cannabis indica, colchicum, digitalis, duboisin, ergot, fish berries, gelsemium, black and white hellebore, hyoscyamus, ignatia, nux vomica, opium, poison oak, pilocarpus, physostigma, strophanthus, stramonium, veratum virid, elaterium and their active principles. All other drugs and chemicals the maximum dose of which is one decigram or less, as given in standard works of pharmacy.

"Class B. Acids, carbolic, hydrochloric, nitric, nitrohydrochloric, concentrated phosphoric, oxalic, picric, sulfuric. Aqua ammonia all strengths. Compounds of barium, copper, cobalt, and soluble compounds of lead and zinc. Potassium and sodium hydrates. Bromin, iodin, bitter almonds, creosote, chloroform, ether, essential oils of mustard and bitter almond.

"The term compound as applied in Classes A and B refers to chemical combinations. While such an arrangement and definition of all that shall be considered of poisonous character is not perfect, the writer contends that it is an improvement, and leaves room for severe criticism only in making a dividing line for all such not specifically mentioned as those the maximum doses of which are 0.1 gram or less. It must be admitted, that there are some active principles and synthetic compounds, the dose of which is more than 0.1 gram, that would possibly be considered as dangerous, but these are such that if the limit line were put at 0.2 or 0.5, some of most harmless nature would be included."—*Dental Review*, Aug., 1899.

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REFLEXES FROM LOWER MOLARS. By James Truman, D.D.S., Philadelphia. Read before National Dental Association at Niagara Falls, Aug. 1-4, 1899. It is somewhat strange that the lesions of dentition have been treated by the majority of medical writers with slight consideration. The opposition by the medical profession to the generally accepted position of the dental, that the reflex disturbance of dentition is of vital importance, can be understood, for medicine, until very recently, has entirely underrated, if it has not entirely ignored, the oral cavity as a source of disease. Medicine has been based on symptomatology, the effect and not the cause receiving attention. It is therefore not a special source of wonder that the neuralgias, the tissue-disturbers, the new foci of

inflammation, having their origin in the teeth, have received only a moderate degree of thought.

The views that this paper proposes to consider are, in the main, written to enforce the idea that more attention should be given to the eruption of the molars than has been accorded them. The same laws of growth are manifested here as in the first dentition, and are equally responsible for serious disturbance along the course of nerve connections. Consideration will alone be given to the lower molars, for the question of growth does not apply with equal force to the upper set. It is, however, recognized that nerve irritation proceeds from these as it does from all the teeth disturbed from their normal relations.

The process of growth, whether in vegetable or animal tissues, is one of the most interesting in nature. John Tomes says: "It would be difficult to estimate the actual amount of mechanical force developed by a growing tooth, but we may form some estimate by observing the force generated by a growing vegetable." If this force of growth be applied to the teeth it can be well understood why in dentition reflex disturbance occurs. The whole question of treatment might be condensed into one word—*room*. With space sufficient for the development of teeth all dentition would simply be a physiological and not a pathological process. It is therefore a question of space or room for development.

Growth proceeds from the first layer of enamel and dentin to the last of cementum, and in proportion as the enlargement proceeds must the tooth be given space for its formation, and to accomplish this the gumward advance must be regular and with no opposing obstacles. In deciduous dentition the obstacles are confined to the gum tissue, and these teeth are equally with the permanent a source of reflex disturbance.

The student of these phenomena has therefore a comparatively simple problem to solve. His duty is first to study the anatomy of the jaw, and the process of growth in the jaw primarily, and to follow this by that of the teeth. He cannot omit in this consideration the position of development and the resulting changes that take place in its progress. The development of the first permanent molar takes place about the tenth week of foetal life, and from this period until the sixth year subsequent to birth is gradually formed into the largest molar of the series. The broad occlusal surface of this

tooth would seem to indicate that at the period of eruption it would be a special subject for pathological disturbance; but it is well known to be more generally free from reflexes than any other of the developing permanent teeth in the inferior maxilla. If the jaw has been examined, it will be found that this exemption is clearly explainable by the width of the jaw, measuring from the gum tissue to the inferior dental canal. The only obstruction to receive serious consideration is the tense overlying gum. This, while resistant, gradually yields to pressure, resorption taking place, and while it may retard eruption it cannot as a general rule cause pressure upon the exposed pulp or upon the inferior dental nerve. Hence there is a marked and almost uniform freedom from neuroses in this tooth, and it may be passed as an unimportant factor in pathological disturbance.

The second, or as it is commonly misnamed, the twelfth-year molar, has an entirely different place in development, and in consequence more fully exemplifies the importance of room for growth than any of the series, not even excepting the third molar, which is usually regarded as the prime factor in neuralgic lesions. From an extended examination of the literature of the subject, nowhere have I found this tooth noticed as a cause of reflex conditions. It is therefore worthy of study in its several relations, origin, development and eruption.

The growth of the jaw posteriorly carries the germs of these teeth well up in the rami, and as development proceeds both in jaw and teeth there is a gradual descent towards the angle of the jaw. The period of passing this point, through development of the latter, to assume the direct vertical position is the critical period. At this time the crowns are fully formed externally and the roots have developed to half their normal length. If the growth of the jaw is in harmonious relation to the development of the teeth, this period may be passed without notice; but such is not always the case. The growth of the roots may have increased more rapidly than that of the jaw, and in passing the angle they frequently impinge upon the inferior dental nerve, or the exposed pulps may possibly be forced by the exceedingly tense gum against the bone envelope, in either case resulting in serious reflex suffering to the individual. The passage of this critical point by these teeth occurs about the ninth year.

The characteristic phenomena at this time are marked cerebral disturbance, resulting in convulsions, epilepsy, chorea, insanity, hysteria, otalgia, ocular diseases, and a long list of more or less aggravated lesions. Tomes gives this opinion on reflex manifestations: "Before serious and painful results can arise there must be a concurrence of many circumstances. The patient must be of a strumous constitution or predisposed to inflammatory action, or the nervous system must be peculiarly susceptible to excitement. In the latter case epileptic fits may supervene. . . . That epilepsy does arise in some cases from this cause is proved by its appearing when the teeth are passing towards the surface and disappearing when passage is given to the teeth."

Dewees ("Physical and Medical Treatment of Children") makes this admission: "And though the teeth cut [lanced] upon may yet be *remote from the surface*, still the operation may be of the greatest possible advantage by dividing the membrane, . . . and the disturbance of the system is quieted from the moment the gum is divided." That the phenomena have been attributed to other causes is not surprising, in view of the fact that comparatively slight attention has been given to dentition as a whole and the permanent teeth in particular.

That this statement is not based on mere conjecture, attention is called to the anatomical relations of the second molar with the jaw. A very cursory examination will bring conviction as to the truth of the conclusions at which I have arrived. My attention was originally called to this tooth as a prominent cause of reflexes at this age by several cases coming under my care, which led to a more critical examination to discover, if possible, the cause and the remedy.

In the case of the second molar, as well as others similarly situated, the relief must come by affording room for growth. It is apparent that this is a difficult procedure with this tooth. It is deeply embedded in the surrounding tissues, and it would seem impossible to afford any immediate relief. The first case that presented and which claimed serious consideration was a member of my own family. At the ninth year this child was, without apparent cause, affected with violent convulsions that assumed an epileptic character. The seizures were prolonged, but days frequently intervened between them. The study given the case developed the hypothesis that the second molar was the pronounced factor in the

cerebral disturbance. To verify this theory the child was carefully watched, and upon indications of an approaching nervous storm the lance was deeply inserted over the position of this molar. The result was entirely confirmatory of the diagnosis, and by care in watching symptoms and a repetition of the lancing whenever necessary, the child passed the critical period without further reflex phenomena. Since that time other cases have been under my care, and the same simple method of treatment has been followed with equally good results. During the present spring a child of nine years was brought to me, suffering intensely with pain in both ears. Examination of the teeth failed to show any cause for this in exposed pulps or other lesions. These having been excluded from the possibility of causing the suffering, it was decided that the origin of the pain was reflex and must be from pressure upon the pulp of the partially developed second molars, or impingement of both upon the inferior dental nerve. The lance was at once applied to both right and left, with immediate relief, and without any recurrence of pain since the operation was performed several months ago.

The third molar is frequently the cause of reflexes. These teeth, like the second molars, find their place of origin in the rami of the inferior maxillæ, and have difficulty in assuming the direct vertical position. The two principal positions assumed by this tooth, causing general nervous irritation, are the oblique and the horizontal. The former is not a frequent cause of reflexes, and while it may produce these by impingement upon the inferior dental nerve, it more often effects this by producing unobserved decay at the cervical border of the second molar, and eventually pressing upon the pulp. The difficulty of diagnosticating this must be evident, for as decay proceeds the tooth advances, filling completely the cavity and causing the lesion to be overlooked, until neuralgic pains indicate some cause requiring the attention of the dental surgeon.

The most serious of all the malpositions of this tooth is the horizontal. The tooth in passing down from the ramus strikes the posterior root of the second molar and there must stop. Deeply embedded in the jaw, with the roots closely impinging on the inferior dental nerve, there is but one possibility, that of pressure upon that nerve, and that continually and more forcibly as growth proceeds. The reflex lesions are, as you are well aware, of the most serious character. The important matter to consider here is the diagnosis.

It is quite evident that a tooth thus situated produces its disturbing effect through lack of room, and that this room cannot be secured so long as all the teeth on that side are in place. If then the entire series, from the second molar to the cuspid, are in position at the age of eighteen to twenty-four, with lancinating and intermittent pains extending throughout the fifth pair, and with no visible signs of a developing tooth, it is evident that the third molar is abnormally developed in the position named. An explorer passed down posterior to the second molar will settle this fact. If, however, the second molar be absent, or is in place and the first molar absent, it remains reasonable that the third molar is not the cause of the neuralgia. The force of growth, as before stated, is quite sufficient to change the second molar from its normal position and thus give room for the development of the third molar. If, however, both first and second molars are in place, the inference may be drawn that the third molar will not have sufficient force to move two such powerfully implanted teeth far enough to afford relief.

The importance of this malposition cannot be overestimated. Fourquet mentions a number of serious cases, and almost every practitioner of dentistry has seen cases of obscure reflex pain which may not have been fully comprehended. There is no lesion more easily treated than this, and yet it is one the general surgeon fails almost universally to diagnose correctly. A case which I reported many years ago may be worth repetition here as an illustration of this statement. A patient was sent to me for examination for a most obstinate case of neuralgia, which had resisted medical and surgical care for twenty years. The physician who sent her expressed himself as hopeless of having her relieved. The woman was a physical and almost a mental wreck. Feeble and emaciated, vision very defective, hearing with difficulty, she presented a most dejected and hopeless appearance. The examination of the mouth gave no indication of a third molar. All the other teeth were in place. An explorer was passed down posterior to second molar, and the third was found occupying a horizontal position, abutting against the roots of the second. The patient was informed that the only remedy was to extract the second molar. No opposition was made and the tooth was at once removed. The effect was immediate, all pain ceasing, and in twenty-four hours the third molar had advanced and filled up the socket of the second. The patient in a

month's time had recovered her hearing, the eyesight was greatly improved, and her condition physically and mentally had become normal, pain having ceased entirely. She should have been saved this twenty years of torture.—*International*, Oct., 1899.

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APPARENT MERCURIAL POISONING FROM RED VULCANITE. By P. B. Laskey, D.M.D., Marblehead, Mass. Read before New Brunswick Dental Society, 1899. The first case was that of a lady of middle age and good general health. She had worn a full upper denture on a red rubber base for some years, but had had an uncomfortable feeling in her mouth for some time, and at last, from inspection, she and her family had become alarmed and she came to me for treatment. An examination showed the membrane upon which the plate had rested to be in a very congested condition, in fact almost to the point of suppuration. It did not have the red look of ordinary inflammation, but was of a deep, brown color like liver, gradually fading and merging into the usual color of the surrounding parts.

As a lady had recently died in our town from cancer of the superior maxillary my patient was of course much alarmed. Now the most obvious and simple thing to do was to discontinue wearing plate and apply a treatment for the restoration of the part to normal condition. On a hint of this kind, for I had begun to entertain fears that there might be such a thing as poisoning from the plate, the lady decided to go home and think it over. This gave me a chance to think it over, and I decided on a course which looked to the curing of the trouble while she was still wearing the plate, and which would determine whether the abnormal conditions were produced by poisoning from the coloring matter, vermilion, which is, as you know, sulphuret of mercury, or from the non-conducting properties of the rubber, or from other causes. By request the lady reported at my office the next day. On close examination it seemed impossible to tell whether the plate had settled into the membrane or the membrane had swollen around the plate; but I concluded that the absorption of the alveoli had let the plate down so that the part had become surrounded by a ring of pressure on the labial, buccal and palatal edges in such a way as to greatly impede the circulation of the blood.

As my object was to effect a cure while the patient wore the plate,

I began to cut the plate away on these edges a very little each day, being careful not to go so far as to render it impossible for the lady to wear it. This cutting was continued for a few days and the mouth began rapidly to return to its natural color. In two weeks all signs of inflammation were gone, and I asked the lady, whom of course I advised to have a new set of teeth, what she wanted them made on. She replied, "Just the same as these." She has worn the new set on red vulcanite without any return of the trouble.

The second case was a parallel of the first. The lady had been anxious about the condition of her mouth for some time and had consulted several dentists, who told her that her mouth was or might be poisoned with the rubber and she must have a gold plate. My object being to demonstrate scientific truth, I proceeded as in the first case (that is, refitting the plate by the eye), and with the same result. At her suggestion I made her a new set on red rubber, which proved satisfactory.

Now I venture to assert that this condition can occur only in a certain class of mouths, and that is the class which we consider the most favorable for artificial dentures, the mouth being of almost uniform texture, caused by the equal distribution of bone and the superimposed tissue. This allows the plate, from the change caused by the absorption of the alveoli, to settle gradually and imperceptibly into the other part, and may interfere with the circulation and produce a chronic inflammation. In other cases where the mouth is more or less bony the inflammation would be of the acute form, and painful, as you know. It would then be evident that the plate was "cutting," and the patient would immediately seek relief of the dentist. There is another point which may have escaped your notice, as it did mine for some time, and it is, that if the cases have been of poison by mercury, then by the continual cutting away of the plate fresh surface was being exposed, and furnished the most favorable condition for the exhibition of the poison. No medicine or washes were used in either case. It may not be out of place to mention that the new impressions were taken in modeling composition.

To sum up, these cases were simply the result of mechanical violence, caused by ill-fitting plates, and I cannot escape the conviction that other cases of so-called mercurial poisoning were from the same cause.—*Dominion Journal*, Oct., 1899.

TRIGEMINAL NEURALGIA FROM DEVITALIZATION OF TEETH. By Dr. M. D. Hamisfar, Springfield, Mo. Read before the Missouri State Dental Association, 1899. It is not my intention to enumerate all the methods of devitalization. I shall give the results of some experiments which may possibly stimulate the dental profession to undertake fresh researches, as trigeminal neuralgia is one of the most acute forms of suffering that the human race has to bear. When in a case of this kind we endeavor to ascertain how the pathological conditions are caused and by what agents we can accomplish devitalization, it will be necessary to review the anatomy and physiological structures of the nervous system and its constituent neurones to a certain extent.

We can scarcely hope for a clearer understanding of the acute pathological conditions arising from devitalization of the teeth until our general histological knowledge has been extended. The topic is one which has been too little considered in the text-books on dentistry, and too little respected by research workers in neurology. One thing is certain, before we can hope for a satisfactory pathology of the ganglion cells, we must have before us clearly a sharply defined anatomy of nerve-cells. The establishment of any relations, no matter whether they be structural or functional, so long as they are constant, must always be welcomed.

The status of our knowledge about the internal structures of the protoplasm of nerve cells may perhaps be summed up as follows: A neurone is made up, like all other cells, of a nucleus and protoplasm. In the latter a centrosome and an attraction sphere are present; at least, it has been demonstrated in a certain number of nerve-cells. The protoplasmic portion of the cell can be roughly divided into a peripheral exoplasmic portion and a central endoplasmic portion. In neurones, as in muscle-cells, though less distinct in the former than in the latter, there is a tendency to fibrillary structure, the fibrillæ tending to occur in the peripheral exoplasmic portion of both nerve and muscle-cells, rather than in the endoplasmic portion of the protoplasm. In both the exoplasm and the endoplasm there can be made out in tissues which have been fixed in more or less homogeneous ground substance, in which are deposited larger and smaller masses of granular nature. The ground substance corresponds in tissues fixed with alcohol and stained by the methods of Held to the "unstainable substance" of Nissl, and

the masses of granules to the "stainable substance" of Nissl in healthy mammals of the same age and species, with the same method of fixing and staining, analogous in appearance and arrangement in the cell bodies of the same group of nerve-cells, as a fact of extreme importance for nerve anatomy and pathology. The axones appear to be entirely devoid of the "stainable substance" of Nissl. Whether the "stainable substance" represents bodies precipitated from solution through the action of reagents or bodies preexistent though invisible, first brought into view through the action of fixing or staining reagents in the hardened tissues, in either case they appear to yield the chemical tests characteristic of the group of nuclealbumens.

Whether the staining reaction characteristic of the "stainable substance" depends upon chemical relations must, for the present, remain undecided.

The "unstainable portion" of the cell-body—that is, the ground substance, though probably functionally much more important than the "stainable," is not so well understood. Its nature and structure are still as obscure as those of protoplasm in general in the ground substance. Aside from the Nissl bodies, very fine granules or undue formations can be demonstrated which stain with erythrosin (Held), and certain parts of the neurones; these are arranged in rows, thus bringing the nerve-cell into agreement with what has been observed in animal cells generally. The ground substance is easily vacuolizable. Erythrosinophile granules apparently represent the nodal points of the mesh-work which results from the vacuolization. With suitable methods, not only can longitudinal markings connecting the nodal points be made out, but also more delicate transverse markings. The peculiar "neurones" described by Held are minute "stainable" masses which lie inside the vacuoles or in their walls.

Formation of Nerve Trace.—From a certain period of development one can discern near the medullary tube on both sides, groups of cells which represent the beginning of the sensory ganglia of the dorsal roots of the spinal nerves. So the cell bodies of all the sensory neurones of the higher order are situated outside of the neural tube or spinal cord and brain as they come from the ectoblast at the junction of the edges of the medullary plate with the adjoining ectoblast, although there are some researches which make it highly

probable that some of the cells do not wander off until the medullary tube has been constricted off from the ectoderm, in the anterior part of the cranium, corresponding to the sensory region of the trigeminus and acoustic facialis area. There exist in the ectoderm, at places corresponding to this junction, plainly defined ridges which are compact with dividing cells quite like those taken to be fore-runners of the nemoblast in the medullary tube. The young cells giving ascendancy to the nerve elements of the spinal ganglia divided by caryocinesis, even some time after they have arrived among the ganglionic groups. After a maturer development of the individual cell, they assume a bipolar shape, one process growing from each pole. The process corresponding to the dendrite grows toward a peripheral sensory surface, the process corresponding to the axone developing centrally until it reaches the outer surface of the outer covering of the medullary tube, into the wall of which it penetrates, bundles of which assume longitudinal directions and go to make the tractus spinalis nervi trigemini. As to the further development and distribution and function and relations, it will be unnecessary to make mention, as any dentist is conversant with the anatomy of the trigeminal nerve, as well as the different structures which make up a nerve, its function and relation to other nerves.

So I will proceed to take up in a brief treatise the nutrition of a nerve. After we have learned to recognize the different structures which belong to the single elements, can the study of the functional units in the nervous system be satisfactorily approached. A vast amount of physiological and pathological research concerning nerve-cells and nerve-fibers has been accumulated. Many of the said researches appear to be antagonistic or even contradictory. In a systematic description of the physiology of the cells, it would be necessary to consider not only the functions of the cells, but such phenomena as those of metabolism reproduction. I shall therefore endeavor to bring forth only a few of the physiological and pathological considerations which will be of special importance to the morphological characteristics above outlined. For convenience and a briefer treatise I shall divide it into two classes: those pertaining to metabolism of neurones or nerve-cells, and those portraying the phenomena of neurones.

Metabolism and Nutrition of Neurones.—Metabolism—anabolic

and catabolic: Like all other cells of the body, the living neurones take up food materials into their substance, transform them, and gradually build them up through a series of synthetic processes into highly complex chemical compounds, which in turn undergo a series of decomposition reactions which culminate finally in the formation of more or less simple bodies, which we recognize as the excretory products of neurone metabolism. In these various modifications of chemical materials, by means of which the potential energy of the food is transformed into the kinetic energy which gives rise to what is called the "vital" manifestations of the neurones, chemical compounds come into existence in some of the cells, at least, of a degree of great complexity, the nature of which the researches of organic chemistry have proven futile to discover. It is in the nervous system that the greatest delicacy and complexity of the chemistry of metabolism are most in evidence. It is then we find the extreme instability of the living substance. The slightest alterations will bring about decided transformations and functional manifestations in the cells, as we can readily see how slight are the active powers of the nerves, when the minute quantities of different poisons will destroy the entire nervous system, killing the largest animals.

Lugaro, in his studies of the nerve cell under pathological conditions—for example, after poisoning with arsenic or lead—finds that the fibrils may become very indistinct inside the nerve-cell, corroborating one of the leading points in this paper—that of absorbing toxic agents into the nerve-cell proper, destroying the same—therefore antagonizing a very general theory among dentists (that is, the pathological conditions brought about by arsenic or other devitalizing agents), that the death of a pulp or nerve is due to strangulation or congestion. This theory has always seemed rather an indefinite and unscientific explanation, granting the inflammatory condition existing, due to irritation, which is always accompanied with more or less pain, where such escharotic agents as arsenic are used, owing to their slowness of absorption or diffusion when locally applied, which we can readily discern if we consider the chemical constituents of nerve-cells and tissues and their relation (chemically) to arsenious acid, the physiological action of which, when properly administered, is an alterative affecting the nutrition of the nervous system. Especially in toxic doses it does

not arrest cell movement at first, but rather accelerates it—hence the pain which precedes the death of the tissue, which cannot be accomplished even with nervous depressants, or agents paralyzing motility and sensibility even by central action in a satisfactory degree.

So in selecting agents for devitalization that are the most efficient we must have in view two objects: First, those that arrest cell-mobility, due to vaso-motor action, rendering the nerves bloodless, or by paralyzing the terminal twigs. Eucaïn is very satisfactory.

Second, protoplasmic poisons or agents which destroy them in the most direct way. Taking into consideration the chemical composition of nerve-tissue and cells, that they contain about 980 to 1000 parts of water, sulphuric acid or chlorid of zinc is the most desirable; especially sulphuric acid, by it being very diffusible, abstracting the water from the tissue, combining with the bases, consequently destroying protoplasm.—*Western Journal*, Oct., 1899.

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MICROSCOPIC ILLUSTRATIONS OF THE EFFECTS OF CATAPHORESIS. By Dr. A. F. Sonntag, Waco, Texas. Read before Southern Branch of National Dental Association, Feb. 11, 1899. Two years ago it occurred to me that the only true and scientific method of investigating this subject would be by means of the microscope. I have prepared a number of microscopic slides to demonstrate cataphoresis, showing the effect on the tooth substance by means of colored solutions. All of my experiments were made out of the mouth, from freshly extracted teeth, and under conditions resembling the natural condition of the mouth as closely as possible. In every instance the tooth was embedded in moist sponge, only the crown remaining uncovered. The rubber-dam was adjusted to prevent any contact of the positive electrode with the sponge, the sponge connected with the negative pole, and the positive pole applied to the cavity. The solution used is a twenty per cent solution of cocain colored with methyl violet. The strength of voltage used is the average that I am using on my patients in practice. I am able to show only the effect of cataphoresis on dentin at present, but in the future I hope to be able to also show you the effect it has on the pulp.

Now let us consider the tissue through which the electric current, carrying with it the solution and the substances it holds, has to

pass to produce local anesthesia. Enamel is composed mostly of inorganic matter containing but little moisture, and by reason of its structure prevents the passage of the electric current and fluids through it.

Dentin, on the other hand, composed of seventy-two per cent of inorganic and twenty-eight per cent of organic matter, a homogeneous mass, penetrated by many parallel canals, filled by soft homogeneous fibrils, having many fine branches and increasing in number toward the periphery of the dentin, gives but little resistance to the electric current. The current, carrying with it the solution, passes through the homogeneous fibrils in the dentin toward the pulp. Dry dentin will resist the current. A glass tube filled with powdered dry dentin, when inclosed in the circuit of the cataphoric apparatus, will resist all the current which the cells in the apparatus will produce.

Slide No. 1. A bicuspid, no decay, the cavity being made artificially. A pellet of cotton saturated in the cocain and methyl violet solution placed in the cavity and left in it for thirty minutes. None of the coloring fluid has penetrated the dentinal tubules.

Slide No. 2. Also a bicuspid, the cavity made artificially, a pellet of cotton saturated in the same solution, and the electric current applied fifteen minutes. The solution has not only penetrated the dentinal tubules, it has reached the pulp; but the coloring does not extend over all the surface of the cavity—only a part of it is affected in large cavities. The current seems to pass through a sufficient number of canals required for its passage, and it seeks the shortest and most unobstructed route where it encounters the least resistance to reach the pulp. This demonstrates plainly that cataphoresis is of but little value in our work, unless we anesthetize the pulp or at least the upper portion of it. Even in small cavities where we can drive the solution into all the tubules that are exposed, if the solution does not reach the pulp all the tubules outside of this small circle will retain their sensitiveness. This accounts for the occasional failures we have. If we could confine our work to the small anesthetized circle it would be successful, but to make undercuts and to prepare the cavity properly we are invariably compelled to go outside this circle. In larger cavities this will be more marked than in smaller ones, although in practical cases it seems generally the reverse; but this is easily accounted for. In large cavities the

pulp is in closer proximity and is more easily reached by the current. Also decay of dentin plays an important part, as we will show directly.

Slide No. 7. Current and solution applied to normal dentin, and section made across the dentinal tubules, the coloring matter showing plainly in the tubules.

Slide No. 8. A root; the external surface ground away, and current and solution applied thirty minutes to the cementum; no penetration of coloring matter.

Slide No. 17. Now we come to consider cataphoresis in connection with carious teeth and the practical value in our everyday work. I have shown with the previous slides that normal dentin is easily penetrated by the electric current, carrying fluids and substances which it holds in solution to the pulp. But decayed dentin does not present the same facility to the current as does the normal. In caries the elements of the dentin are removed, producing first a softening of its structure, and as the process progresses further disintegration takes place until all the original structural elements are lost. The dentinal fibrils are the first to be attacked, the fibril substance destroyed, the lime-salts softened, leaving the dentinal canals filled with waste product. Here we have our minute conductors of the electric current destroyed, producing entirely changed conditions. Decayed dentin will not permit the current and fluids to pass through it readily; it offers too great a resistance by reason of its non-structural condition. By that I mean only dentin which has lost its structural form, not the deeper layers that have been affected by decay but still retain the structural form.

Slide No. 9. A cavity to which current and solution was applied without removing the thick layer of decay, with the result that we have practically no penetration.

Slide No. 13. The superficial layer of decay removed before applying the current, and the result is that the penetration is complete at two points in the dentin and extends through it to the pulp-chamber. This is the typical result of successful anesthesia, and it shows us that we must remove the superficial layer of dentin, or part of it, at some point in the cavity.

Slide No. 14. To more fully demonstrate the resistance offered to the electric current by decay I have prepared this slide. Before applying the current to the cavity, which contained a thick layer of

decayed dentin, I exposed the healthy dentin at another point some distance from the cavity, the pellet of cotton with the solution covering both points, but the electrode placed only in the cavity. The result is that we have but little penetration of the coloring fluid in the cavity, but where the healthy dentin is exposed the penetration is complete, although the distance between the cavity and the pulp is much less.

Slide No. 15. A cuspid, the enamel worn off of cutting-edge by mastication; current and solution applied thirty minutes; no penetration of solution.

Slide No. 16. A similar tooth, but before using the current the superficial surface of the exposed dentin is cut away, thereby opening the dentinal tubules and giving more free access to the solution, with the result that the penetration is complete.

In conclusion, the solutions used in cataphoresis should always be only pure cocain. I notice that many advocate the use of solutions containing other ingredients to make them antiseptic and to give better conducting power. These solutions may work better, but I would be very much afraid of the result they might produce. If cocain in solution will penetrate and reach the pulp, the other ingredients will do so also, and while the cocain produces only local anesthesia, which passes off in a short time, any other ingredient contained in the solution might produce results disastrous to that delicate structure. My method in practice is to moisten a pellet of cotton large enough to fill the cavity in water, then dip it in pure cocain crystals and place it in the cavity. Only a few crystals are necessary to produce the desired result.—*Dental Cosmos*, Sept., 1899.

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MICROORGANISMS OF THE MOUTH OF THE NEW-BORN. Giuseppe Campo (*Pedriatria*, Naples, vii., 229, August, 1899) has carried out a series of researches on the microorganisms of the mouth of the newborn in order to ascertain (1) if the mouth at the moment of birth is free from germs; (2) the development of germs along with the establishment of the primary functions of life; and (3) the isolation of them and their pathogenic action. The contents of the mouth were taken at the moment of birth (the head of the infant being still on the perineum), four hours later when respiration had been going on, and twenty-four hours later when lactation had been commenced. Ten infants were examined at

these three times, and twenty-one others were examined at one or other of the times named. Campo concludes that the mouth is sterile at the time of birth, for out of twenty-one cases in which the buccal contents were examined at the moment of birth, in six no germs were found; the fifteen cases in which organisms were found do not in his opinion invalidate the conclusion, for in some of these the contents were collected by the midwife in attendance, and in others it may be that germs gained entrance from the maternal vagina during labor. The effect of respiration was that the mouth bacilli multiply with great rapidity; they were the bacillus mesentericus vulgatus, the bacterium termo, and the bacillus ulna. The first effect of lactation was found to be a diminution in the number of germs, possibly due to the mother's milk washing them downwards into the gastro-intestinal tract; but its second effect seemed to be to increase the number in the kinds of germs. This effect Campo thinks is the result not of new varieties being introduced in the milk, for the milk direct from the breast is sterile, but of a power conferred by the milk upon the buccal contents of growing new kinds of germs. The organisms found were in order of frequency; the bacillus mesentericus vulgatus, the bacterium termo, the bacillus ulna, subtilis, leptothrix, and lineola (?) and three non-identified germs, to which the names of bacillus α , and coccus γ and z , have been given. It was further discovered that none of these microorganisms had any pathogenic properties, for intraperitoneal injections of cultures of them into guinea-pigs did not produce any phenomena indicating virulence, save a slight diminution of the body weight. The characters of the non-identified germs and their cultures are fully described; bacillus α and coccus z caused passing loss in weight.—*British Medical Journal*.

DANGERS OF HYDROGEN PEROXID AS A SURGICAL ANTISEPTIC.—G. U. Spencer sounds a note of warning against the use of hydrogen peroxid as a disinfectant for wounds in certain localities. He cites numerous cases, both in his own experience and in that of others, in which the employment of the solution appears to cause the spread of pus-producing bacteria to other parts. This is due to the passage of bubbles of the gas evolved from the agent, which possess the power of traveling through relaxed tissue, along nerves, in the tendon sheath, and in the planes of the muscles, and thus carry infection with them. For this reason it is unsafe to use it for abscess cavities, or in the washing out of infectious wounds, also in the tissues surrounding the larynx and trachea, especially in young children.—*Ther. Gaz.*

Letters.

NEW YORK LETTER.

NEW YORK, Nov. 22, 1899.

To the Editor of the Digest,

MR. EDITOR:—At the clinic of the Odontological Society this month Dr. Geo. Evans illustrated the use of porcelain facings of gold crowns with high and low fusions, showing some unique and artistic results. Time and experience will show the value of such work, but it is a commendable experiment.

Another big gathering is in prospect for January, and the society deserves great credit for these attractive meetings.

The speaker of the evening session, Dr. C. A. Marvin, gave a review of forty-seven years' practice, most of which was in the city of Brooklyn, and many of the old timers joined in the discussion and told tales of bygone days. Dr. Marvin is a brilliant speaker, and has been termed the "silver-tongued orator." He is not in sympathy, however, with the celebrated Nebraskian who is panting for McKinley's tenement in Washington. (Croker says he has a sure thing this time—perhaps.)

Politics in New York are nowhere compared with the rumors about a journal which is to be the representative dental organ. Such a move might bring about more unanimity of thought and action between the various cliques in Greater New York, but to start a journal is no light task, and to run it successfully is still harder.

There is a most excellent portrait of the late Dr. Bonwill in the October DIGEST, and the obituary is well expressed. One of his many good qualities was his readiness to acknowledge a mistake. He once introduced what he thought to be a new form in the face of a filling instrument. When his attention was called to an article in the *Cosmos* by us, in which the same instrument was illustrated, he at once wrote a most courteous letter to us acknowledging his error.

Honor is a commodity of value among dentists, yet it is common talk that there are some who do not think so. We learn that certain members of our profession in this vicinity expect to reap thousands from their fellow practitioners as a result of the crown and bridge litigation. No one will envy their ill-gained wealth. The

tragic end of Bacon in the vulcanite litigation of years ago should be a warning to seekers after blood money.

At the November meeting of the Odontological Dr. Nash read his paper on "Alveolar Necrosis." His idea is that this disordered state of the alveolus is associated with a nervous condition which has its exciting cause in marked disturbances of the environments of the patient. We can confirm this by our own observation. Dr. Nash believes, as brought out by Williams' paper last year, that microorganisms are a large factor in bringing about this alveolar necrosis. This reminds us that when Mr. Charles Tomes first visited this country he was present at one of Dr. Riggs' clinics before the Harvard Dental School, and expressed the opinion that we should ultimately discover the etiology of this disorder to be in line with that of dental caries.

Dr. Nash's paper was fully discussed by Dr. Rhein, who expressed himself forcibly against the modern nomenclature, insisting that "Pyorrhea Alveolaris" was correct. It was shown, however, that this particular phase of the disorder has no pyorrhea associated with it. Dr. Martindale's definition of this thought of necrosis, as apart from the necrotic condition, would be of value. It is in print somewhere. Can anyone give it?

We recall an incident in the late Dr. Riggs' life, which will explain why he never wrote a book about the disease which has been named after him. We and his other friends had often urged him to make some definite statements regarding his views, and about two years before his death he decided to do so, and began by dictating to his neighbor, the late Dr. Snow, his thoughts about the disorder. It came to his ears, however, that his amanuensis told people he personally was writing a book on "Riggs' Disease," so Dr. Riggs dropped the matter and could never be induced to take it up afterward.

The illustrations from Boston in the November *Cosmos* will interest many. Not long ago Boston held up its hands in horror at the nude in art, and refused to have the beautiful and now celebrated piece of statuary in its Public Library. What will they now say of these two great "Bareback Feats?" It seems to us that porous plasters would be in order.

The good will of the late Dr. Bonwill's practice is for sale. Who could take it? It may not be known that the Doctor's home was

the one formerly given to Gen. Grant by the citizens of Philadelphia.

We forgot to mention Dr. Van Woert's discussion on Dr. Evans' paper, in which he stated that he was able to get platinum rolled to the two-thousandth of an inch, and that by annealing it in an electric furnace over slacked lime he could make it as easy to handle as pure gold, which made the use of higher fusing bodies possible.

Among the numerous obituary notices we see the name of that genial veteran, Dr. Straw of Newburg, N. Y.; also that of Dr. Hayhurst of Lambertville, N. J. Both these men had taken an active part in society proceedings for the last thirty-five years.

We learn that Dr. Younger goes to Paris as an associate of Dr. Crane—a younger man. Keep moving.

Cordially, NEW YORK.

WHAT IS THE OFFICE OF THE STATE BOARD?

———, ILLINOIS, Nov. 14, 1899.

To the Editor of the Digest,

DEAR SIR:—What is the duty of the Illinois State Board of Dental Examiners? Is it to regulate the practice of dentistry in this state? Are there any substantial laws regarding this subject? Is it the duty of the examining board to see that these laws are enforced?

Let me cite a case in actual practice, which is still existing to-day, and to remedy which no steps have ever been taken, or, so far as I can see, ever will be taken. A young man who spent his freshman year at the Northwestern University Dental School has come home thinking that he knows and has learned as much in one year as others do in three. He therefore goes into the office with his father and begins the practice of dentistry. He announces himself as "Late of the Northwestern Dental College, Chicago"; and also advertises: "Crowns, \$3.00; Gold Bridges, per Tooth, \$3.00; best \$8.00 Teeth, including Extraction of Teeth, \$6.00; Gold Fillings, including everything (all sizes), \$1.00; Amalgam, Gold and Platina Alloy, White, Bone, Cement, and all Combination Fillings including Treatment, 50 cents; Painless Extraction of Teeth, 25 cents."

He was reported to the state board, who appeared much interested and promised to look into the matter at once. Not doing so they were notified again, but two months have passed and nothing has been done, and the young man continues to practice.

Is it right that he should be allowed to do so with only one year of schooling and no license whatever? Whose duty is it to look into the matter? He is imposing upon and deceiving the public, and this is a case of the people against the student.

Is the board kept up by the state? Is it their duty to see that the laws are enforced? Should time or expense be spared when the welfare of the people are at stake? If there is no law on this subject, or no one to enforce a possible law, then it is a farce to call the colleges "Educational Institutions," and the state examining boards exist only in name.

Mr. Editor, I would thank you to enlighten me on this subject through your columns, and would also like to know what the dentists of our state think about it.

Yours for the betterment of the profession,

A READER.

BALTIMORE LETTER.

Dear Digest:

BALTIMORE, NOV. 19, 1899.

A recent lecturer in Baltimore upon Bird Life says of the Oriole, that at certain seasons of the year he devotes himself entirely to his domestic affairs, and is not for a considerable space of time heard to utter a note. Oriole, who writes to you, is not altogether unlike others of his class in this respect. Last month he wanted to write, but was completely absorbed in other matters. First, he had a flying trip to Holyoke, Mass., to attend the meeting of the North-eastern Dental Association.

It was indeed very enjoyable to greet old friends and make some new acquaintances in New England. The meeting was a great success, attendance large, and there was a smartness about the conduct of affairs that almost took the breath out of a lazy southerner. There was abundant hospitality and good cheer; in fact, little to criticize; though as that is Oriole's primary function, he will mention one feature that he considered unfortunate, viz.: the presence of two very objectionable characters among the exhibitors, and the fact that these men, while paying rent to the executive committee, were disposed to flaunt their vices with greater vigor and apparent authority.

One old quack nostrum peddler has been an eyesore to and a stench in the nostrils of decent people for a long time. He is not wary enough to catch old birds like us, but plies his nefarious trade

among the younger members and visitors. These deserve the fostering care of older heads and are not entitled to have snares and pitfalls set for them at dental meetings. The other rascalion, whose presence was a blot upon the order of fitness, was a man who represented a large manufacturing concern, but whose chief object in life seems to be to vilify and traduce the chairman of the Dental Protective Association. He got a pretty severe jolt in the shape of a scathing rebuke from our friend, Jones, but such men as these should be marked and should be denied the privilege of attendance at our meetings.

If the members of our profession have not sufficient loyalty to champion a brother's cause in his absence, they might consider the subject of gratitude to this same chairman; or if they don't think the occasion a fit one for a demonstration of gratitude, then in heaven's name let them place their unequivocal denunciation upon lying and slander as vices that cannot be indulged in against any practitioner of dentistry in their presence. We are certain that none of the authorities at this meeting were cognizant of the habit or purpose of this scoundrel, but we want such men marked so that similar mistakes will not be made in future.

A delightful feature was the visit to Mount Tom, over twelve hundred feet above sea level, where a beautiful view into several states was to be had. Oriole is afraid that many of the hard things that have been said of him are true; certainly he has not effectively trained for high altitudes, for while every one else was in a condition of ecstasy over the magnificence of the view, he was oppressed and subdued and very glad to get to his level—of the sea. We left that night, sorry to miss some papers whose titles appealed to our interest, and we carried away many pleasant recollections of courtesies and a very flattering estimate of New England hospitality.

On our way home we spent some time in Boston, where we had an opportunity to visit and see the workings of the Institute of Technology. We wish there were such an institution in every prominent city of this country. We were surprised to learn, however, that dental students as a class do not patronize it. My! What a preliminary course could be picked out for them. Boys have no idea of the immense advantage which such a training would be to them in dentistry. When we have more time and space we will say more about this.

Our state society has had a jolly little clinic and an evening of essays recently. There were about a hundred and twenty-five in attendance, and every one seemed to be happy.

Dr. Beadles, of Danville, Va., quite shook us up with a breezy paper on "The Status of Dentistry." Taken in conjunction with his discussion no offense could be taken to his position, but the paper alone presented some radical views which we cannot tolerate, nor do we think they will be acceptable to even a small minority of the profession. The doctor wrote his paper under the provocation of enforced jury duty, which explains his general disgust that in the eyes of the law we have not a standing which secures for us the deference granted to graduates in medicine.

No man should be ashamed of the fight which dentistry has made for advancement and position, and we should all feel proud of the fact that what place and progress she has made have been possible partly through our efforts. Honestly, we'd rather be in the fight for distinction and recognition than to have inherited it through medicine. If one had never been touched by or involved in the activities of this new world, he might imagine that the creator paved the streets and reared the buildings, but the patient toilers throughout this broad land know that under God's mercy they are step by step slowly but surely building a civilization whose foundation is planted on freedom's rock, whose beams and girders are not hewn from caste and tradition, but shaped from the sturdy oak of individual merit and brotherly love, and whose towers and turrets shall climb into the heavens themselves.

What do we care for inheritance when our hearts are on fire to do our part in this noble work? Rest assured that though one or a dozen drop out, the work will go on to completion, and that long before the capstone is laid dentistry will have won honorably and securely her position among the learned professions. There is much more to say, but will write next month.

Cordially,

ORIOLE.

INSURANCE AGAINST SICKNESS.—In 1889 a law was passed in Germany that every German with an income of \$750 and over must insure his life against sickness and old age. In 1898 there were 11,200,000 persons in Germany thus insured, and so many of these had pulmonary consumption that thirty-seven of the insurance companies erected at their own expense a sanatorium for the care of these persons.—*Maryland Med. Jour.*

The Dental Digest.

PUBLISHED THE TWENTIETH DAY OF EVERY MONTH

At 2231 Prairie Avenue, Chicago,
Where All Communications Should be Addressed.

Editorial.

"SOME INSIDE FIGURES."

[This editorial appeared in the September issue, but we have had so many requests for extra copies that it seemed best to republish it.]

Trusts are usually secretive. They shun the light of publicity and prefer to work in dark and devious ways. At the trust conference recently held in Chicago, under the auspices of the Civic Federation, while all phases of the evil were discussed, there seemed to be a general belief that complete publicity of accounts, operations and methods, enforced by government inspection and supervision, would make these mammoth combinations powerless to plunder the public. It may be that the managers of the dental trust are becoming alarmed at the spread of anti-trust sentiment, and have shrewdly decided that a voluntary exposition of the affairs of the company, carefully drawn up from the inside, would be better than an enforced showing made by a public official from the outside. However this may be, we notice that all the dental journals controlled by the trust contain an alleged statement of the affairs of the S. S. White Dental Manufacturing Company. The company purports to give "some inside figures" regarding its operations, but after reading the statement we fail to find any facts of value to the profession. The "inside figures" are merely an egotistical boast of bigness, and are more remarkable for what they conceal than for what they express. The reader is informed how many million teeth are carried in stock, the number of employes on the pay-rolls, and is expected to contemplate with awe the elephantine proportions of the combine.

We are of the opinion that every dentist who is a purchaser of supplies would be better and safer in the practice of his profession if the manufacture and sale of these articles were not so nearly controlled by one large concern. We quote from the circular as follows:

"If the company should retire from business, or turn its attention to other branches of manufacture, there would be a great void in the dental supply business that it would take years to fill. It has taken two generations of hard, faithful work to place the house where it stands to-day, and for all that are in the business outside, it would probably require at least another generation to fill the gap and to supply the profession as well and as completely as it is supplied by us to-day."

Is this a veiled threat, or merely a piece of rhetorical bombast? Does the trust wish the dentists of the United States to understand that they are absolutely dependent upon a single corporation for the supplies necessary to carry on the great work of the profession? Stripped of its verbiage this paragraph means: "We've got you where we want you. You can't get along without us. What are you going to do about it?"

The claims of the dental octopus are of course greatly exaggerated. It is almost impossible to destroy competition and no dentist needs to be informed that he can, if he so desires, obtain anything in the form of supplies in any quantity at short notice from a concern that is not only outside the combination breastworks, but is distinctly and defiantly opposed to trust methods.

To calm the perturbed bosom of any dentist who may have become alarmed lest the S. S. White Co. may suddenly stop, bringing the entire profession to immediate chaos, we have been requested by the directors of the Dental Protective Supply Co. to state that they are prepared to give a bond of \$5,000,000, in the event of the withdrawal of the trust, that ample supplies will be forthcoming. If the combination should abandon the field the only loss would fall upon its salaried officers and the army of trust beneficiaries in all parts of the country. The profession at large would welcome an era of free competition in dental supplies—an era in which merit would win and honorable methods would prevail, but there is not the slightest danger of the big combine voluntarily going out of existence. It may die a violent death, but it will never resign.

It is well enough to parade figures showing the magnitude of operations and the amount of business done, but some data describing how this immense traffic was built up would be more acceptable. We are not told how many competitors have been crushed, how many inventions have been suppressed, or how many educators and editors have been subsidized. While giving its "inside figures" the trust should have explained how it has sought to create a

monopoly by mythical patents that will not stand examination. Patents of minor importance are paraded as vital and the combination seeks to coerce where it has not the legitimate power to control. Statistics upon these points would be of absorbing interest to the profession.

Several paragraphs of the trust circular are unworthy of serious consideration, but we cannot refrain from alluding to this sentence: "We are not Ishmaelites, and have not been warring upon anybody or pulling wires for position." Think of it! The managers of the dental trust have never done any wire-pulling. They have never subsidized prominent men, terrorized patentees, fed trust pap to the editors of dental journals, or indeed done any of the devious and unexplainable things that other trusts are so frequently charged with. An honest trust is the most remarkable creation of modern times.

PAST, PRESENT AND FUTURE OF THE DENTAL PROTECTIVE ASSOCIATION.

By the time this issue of the DIGEST reaches our readers the period will have expired during which the Dental Protective Association agreed to accept new members for protection against the claims of the International Tooth Crown Co. for royalty on the Low bridge patent. The need for uniting with the Association has been set forth in these columns time without number. Most of the other dental journals have advised their readers to join the Association. We have issued an immense number of circulars and postal cards giving all facts in detail, and stating to the profession that only paid-up members would be protected after December 1, as the doors would be closed at that time. So that no man might say we had not given him abundant opportunity for coming in with us, we agreed to accept young graduates and those in straightened circumstances, upon receipt of ten dollars and their note without interest payable in six months for the other ten dollars. It will thus be seen that if any dentists are not now members of the Association it is due to their own inaction.

It may be asked why it was necessary to stop taking members after December 1, and in reply to this we would say. First, that the members almost without exception demanded that only those be protected who helped bear the expense, and that some means be de-

vised whereby the Association, which comprised but a small part of the profession, should not protect every dentist in the United States. In a large majority of cases the members refused to pay the assessment unless some arrangement of this kind was made. The second reason is, that the members deserved all protection that the Association could offer, and should be free from the annoyance of lawsuits, etc. To do this it was necessary that a line be drawn between members and non-members.

The third and valid reason is, that as we receive no compensation whatever for services given to the Association, in justice to ourself we could not afford to spend the rest of our life in organizing the Association or in defending lawsuits.

We are gratified that so large a number have joined with us, and our only regret is that every dentist in the profession does not belong. Such men would not only benefit themselves but would make stronger this already powerful organization. The Dental Protective Association has a greater field of usefulness than is yet dreamed of, and we would discuss its future plans in detail at this time, but the arduous task of perfecting our organization, answering the thousands of letters which have poured in upon us, and preparing the lines of defense for present and future suits has consumed all our time and energy.

IS THE ILLINOIS STATE BOARD OF DENTAL EXAMINERS WORTHY OF CONFIDENCE?

On another page we print a letter from a dentist practicing in an Illinois town, directing our attention to the fact that a freshman from a dental college has hung out a conspicuous sign, advertised in the newspapers and begun the practice of dentistry.

From personal investigation we learn that this matter has been reported to the State Board, but that nothing has been done to prevent this fellow from imposing upon a credulous public and bringing disgrace upon an honorable profession. We further learn that the young man's father has some local political influence, and that no lawyer in that county cares to prosecute the case. The Board being composed of political appointees, they probably do not wish to incur the father's enmity, or they would have their own attorney prosecute the case.

Is the State Board indifferent or venal? Is it possible that the

management of dental colleges encourage their undergraduates to practice when it is an established fact that the students are entirely unfitted to perform proper service? At any rate, there is a vast number of undergraduates and illegal practitioners in the state who are following the pursuit of dentistry, and so far as results are concerned the State Board is doing almost nothing to remedy the abuse.

We have made some investigation of the matter and are astounded at the lax and negligent methods that prevail. Is the Illinois State Board of Dental Examiners a nonentity or is it profiting by the conditions that exist? This is a question which the dentists of this city and state are asking each other more and more frequently, and as a journal devoted to the interests of the profession we cannot remain silent.

We have not seen a report of the State Board in several years, and it is said on good authority that no pretense is made of rendering an account of the receipts and expenditures. We further learn that many of the licenses issued are not signed by the entire Board, and that the minority of the Board is kept in ignorance of much that is done, in some instances not even being notified to attend the meetings. It has never been explained to our satisfaction why a letter, purporting to be from the Board, was sent from here and published in the Milwaukee papers, to the effect that the Illinois State Board would not recognize the diplomas of the Milwaukee Dental College, as this was absolutely contradicted within a day or two by an honorable member of the Board, who stated that no such action had been taken. So far as we can see, the Board doles out licenses, collects fees, prosecutes in some cases and in other instances refuses to molest illegal practitioners, according to its own pleasure or profit.

It may be that the Board fails to realize that public office is a public trust, and that public officers are liable to criticism for their acts. If the Board has lapsed into inertia it should be severely censured, or if the facts in the case warrant it, the guilty ones should be summarily dealt with. Public welfare and the good name of the dental profession demand that the men who have accepted the office, and whose place it is to enforce the laws, shall do so.

DAMAGES FOR TYPHOID FEVER.—A man in Philadelphia has been awarded \$1,500 damages for an attack of typhoid attributed to contamination of his water supply by the overflow from a sewer left uncompleted by the city.—*Sanitarian*.

Notices.

EASTERN IOWA DENTAL SOCIETY.

The eleventh annual convention of this organization adjourned Nov. 10, 1899, after a very successful meeting. The following officers were elected for the ensuing year: President, I. S. Mahan; Vice-President, T. A. Gormley; Secretary and Treasurer, J. P. Ferrin.

INTERNATIONAL DENTAL CONGRESS.

The transportation committee of the National Dental Association for the International Dental Congress in Paris next year is perfecting arrangements for tours and special rates for delegates and their families, and in all probability they will be completed so as to appear in the January issue of the journals.

W. E. GRISWOLD, Sec'y, Denver.

NATIONAL SCHOOL OF DENTAL TECHNIQS.

The annual meeting of this organization will be held at the Continental Hotel in Philadelphia, beginning at 10 a. m., Wednesday, Dec. 27. Every teacher in the profession should be present, for a most excellent program will be presented. Special features are a lecture and demonstration by Prof. J. Liberty Tadd, and papers by Drs. Faneuil D. Weisse, C. S. Case, D. A. Gritman, A. E. Webster, W. H. Whitslar, M. H. Cryer, H. J. Goslee, Otto Arnold, I. N. Broomell, G. V. Black, A. H. Thompson, James Truman and others.

GEO. H. WILSON.

LATEST DENTAL PATENTS.

- 634,135. Tooth-powder box, Irad Hawley, East Orange, N. J.
- 634,906. Case or cover for heads of tooth brushes, Henry G. McClockey, Galena, Ill.
- 635,244. Dental tool-guard, John A. Gholson, Clarksville, Tenn.
- 635,773. Means for securing tooth-crowns to roots, Harry F. Hamilton, Boston.
- 635,893. Dental plugger, Walter A. Inglehart, Philadelphia.
- 636,027. Disinfecting appliance, Max Elb, Dresden, Germany.
- 636,284. Porcelain tooth-crown, James R. Osborne, Shelby, N. C.
- 636,285. Veterinary dental forceps, Benjamin F. Pinson, assignor of one-half to T. J. Hughes, Blackwell, Okla. Ter.
- 636,359. Dental root drill, Charles P. Schultz, Pawtucket, R. I.
- 636,367. Dental cement, Albert P. Tschirner, St. Louis.
- 636,462. Dental bib, Kossuth W. Small, Richmond, Me.
- 636,476. Dental handpiece, Frederick E. Webster, Clarendon, Ark.
- 636,568. Tooth-crown, Lewis S. Seeley, New York.
- 636,571. Dental disk-holder, Gideon Sibley, Philadelphia.

News Summary.

GILBERT L. MCCLUNE, a dentist at Ovid, N. Y., died Oct. 31, aged 35 years.

GEO. W. SOHAN, a dentist of New York City, killed his father Nov. 13 because of money troubles.

OLIVER KELLS, a well-known dentist of Steubenville, O., died of heart disease Oct. 24, aged 65 years.

S. M. WILKIE, 43 years old, a dentist of Chicago, died Nov. 20, from fatty degeneration of the heart.

J. C. MILLER, 77 years old, a dentist of Mechanicsburg, Pa., died suddenly Nov. 9, from a stroke of apoplexy.

D. G. WEBER, a dentist of Lewiston, Me., died Nov. 14, from an overdose of morphine taken to relieve pain.

R. M. LANE, a dentist of Springfield, Mass., was severely injured by the explosion of a vulcanizer in his office Oct. 31.

B. F. HADLEY, a dentist of Clarksville, Tenn., died Nov. 16, from injuries received when he was run over by an electric car a short time previous.

NEW SOCIETY IN VIRGINIA.—The dentists and physicians of Augusta Co. and Staunton, Va., formed a medical, dental and scientific society on Nov. 15.

MILWAUKEE DENTAL COLLEGE has organized a dental society of the students which will meet monthly. We would commend the action to other colleges.

JOHN A. TAYLOR, a well-known dentist of Phoenixville, Pa., has been missing from home some days, and his friends are much alarmed over his disappearance.

APOPLEXY DURING EXTRACTION.—A man Allegan, Mich., was stricken with apoplexy while having some teeth extracted, and the chances for his recovery are small.

DENTIST ARRESTED.—According to the *Cleveland Recorder* C. A. Wallace, alias C. B. Webb, alias R. Reeves, was convicted of petit larceny not long ago in the above city.

STRONG-MINDED.—“Is he strong-minded?”

“I should say so; he can read all the patent medicine ads and never think he has any of the symptoms.”—*N. Y. News*.

RICHARD GRADY, a well-known dentist of Baltimore, has been appointed dentist at the Naval Academy. The salary is \$1,600 per year, and the appointment is somewhat of a professional honor.

WANTS \$2,500 PER TOOTH.—Gaetano Capaldi, according to the *Chicago Times-Herald*, has filed a suit against the Boston Dental Parlors for \$5,000 damages for the loss of two molars which he declares were needlessly extracted.

CANTON, O., DENTAL ASSOCIATION.—At the annual meeting of this organization, held in October, the following officers were elected for the ensuing year: President, Josiah Hartzell; Vice-President, Hugh Mitchell; Secretary and Treasurer, J. B. Deweese.

AID TO THE BRITISH IN SOUTH AFRICA.—The statement is made that the Boers in South Africa consume large quantities of patent medicines of American manufacture. Thus do we seek to aid the Anglo-Saxon by undermining the Boer constitution.—*Med. Record*.

HARTFORD, CONN., DENTAL SOCIETY.—At the annual meeting of this society, held in October, the following officers were elected for the ensuing year: President, N. J. Goodwin; Secretary and Treasurer, Edward Eberle; Executive Committee, Henry McManus, C. H. Griggs, H. J. Pillion.

POISONED BY COCAIN.—A man who was found wandering about the streets of Philadelphia in a dazed condition recently, and who was restored to consciousness at the hospital, stated that cocaine was injected in his gums at a dental college where he went to have some teeth extracted, and that he had no recollection of what transpired until he found himself in the hospital.

EXAMINING BOARD UPHELD.—A writ of mandate to compel the state board of dental examiners to indorse a diploma, on the ground that it was issued by a reputable dental college, is denied, in *Van Vleck vs. Board of Dental Examiners* (Cal.) 44 L. R. A. 635, when the board has decided to the contrary, under statute requiring them to indorse the diploma "when satisfied of the character of such institution."

"CHEMISTRY AND METALLURGY APPLIED TO DENTISTRY."—Vernon J. Hall, Ph.D., is the author of this treatise, which he modestly states to be but an outline of information. The book has been, as a whole, kindly dealt with by the critics, and has the commendation of many prominent educators. It contains many useful hints to the young practitioner and student. Price \$2, postpaid. The Technical Press, Pub., Evanston, Ill.

BY PROXY.—Aunt Ethel—Well, Beatrice, were you very brave at the dentist's

Beatrice—Yes, auntie, I was.

Aunt Ethel—Then there's the half crown I promised you. And now tell me what he did to you.

Beatrice—He pulled out two of Willie's teeth.—*Punch*.

ACUTE FOLLICULAR TONSILLITIS.—1. \mathcal{R} Guaiacol, 2 fluid drams. Expressed oil of almond, 2 fluid drams. Apply on the inflamed tonsil with a throat-brush.

Give internally:—2. \mathcal{R} Potassium bromid, 80 grains. Sodium salicilate, 1 dram. Deod. tinct. of opium, 1 fluid dram. Cascara cordial to make 1 fluid ounce. Teaspoonful every four hours, in water.—Ingals, *Chicago Clin. Rev.*

TEETH OF CLIFF-DWELLERS.—From discoveries made at Santa Clara, N. M., last month it appears that a race of cliff-dwellers formerly inhabited that region. The skulls show that the cliff-dwellers had a long, intelligent

face, strong chin, high brow, and a skull perfectly flat on the back. The teeth are rather prominent, but the incisors are missing, and in their place are full grinders—an indication that the cliff-dwellers were vegetarians for many generations.

GET YOUR MONEY'S WORTH.—Tightfist—I've been as far as the door of the dentist's office three times, but I can't get up the courage to go in.

Watts—I'll tell you what to do; send the money down in advance. That will make you desperate.—*Indianapolis Journal*.

AMERICAN DENTISTS PRACTICING ABROAD should be careful to investigate the laws of the country as regards titles. According to the *Jour. of American Med. Assn.* for Sept. 23, the sign "Dr. Sylvester, American Dentist," at the entrance of his office in a French city resulted in the condemnation of the dentist on two indictments: 1. For practicing under a pseudonym, as his name was in reality Sylvester Baumgartner. 2. For neglecting to append the source of his medical diploma, the court asserting that dentistry being a branch of medicine, the derivation of the title of "Dr." must be stated on the sign to conform to the French law in respect to aliens practicing in France.

TO HARDEN PLASTER OF PARIS.—According to the *Medical News* for Sept. 23, a hardening fluid, which will be useful to surgeons for making plaster splints last longer, and also for protecting them against moisture, has been granted a patent in Germany. The liquid may be mixed with the plaster or applied subsequently to the splints. The solution is prepared by dissolving boric acid in warm water and adding thereto sufficient ammonia to form the borate, which remains in the solution. The manner of using the solution is thus described: The saturation of the gypsum or painting of the plaster of paris is carried out in the cold. The objects are subsequently rinsed off and dried. The surface becomes very hard after two days and insoluble in water, while the induration in the interior advances more slowly.

ANALYSIS OF THE ENAMEL OF THE HUMAN TEETH.—A. H. Elliott, Ph.D., New York, has made the following analysis:

Phosphate of calcium.....	87.97
Phosphate of magnesium.....	1.10
Carbonate of calcium	6.75
Organic matter.....	1.75
Soda, salts, etc.....	2.43
	<hr/>
	100.00

The above is an average analysis from the enamel of twenty different teeth. In comparison with the analysis of Von Bibra and Hoppe Seyler, Professor Elliott finds a little more of the phosphate and a little less of the carbonate of lime.

NOT TO BE BEATEN—The *Indian Medical Record* is responsible for the following druggist story: "A gentleman received a note from his lawyer which he was unable to decipher. On the way to his office he met a friend at the door of a chemist's shop. The friend, after vainly attempting to read the

note, suggested that they step inside and hand it to the chemist without comment. The chemist, after studying it in silence for a few minutes, stepped behind the prescription case, and in a short time returned with a bottle of medicine, duly labeled, and bearing directions. When the gentleman saw his lawyer he was informed that the note was a notice for him to call at his office between 1 and 4 o'clock p. m. of the following day."

ANESTHETIZATION OF THE SPINAL CORD BY COCAIN INJECTIONS.—Bier (quoted in *Munchener Medicinische Wochenschrift*, No. 21, 1899) has conducted a remarkable research, having for its object the production of anesthesia in large sections of the body by means of cocainizing sections of the spinal cord. After having employed Quincke lumbar puncture, a very small quantity of cocain was injected into the subdural space—from one-twelfth to one-sixth of a grain. Following the injection operations such as resection of the ankle and knee joints, sequestrotomy of the tibia, resection of the tuber ischii, and resection in complicated fractures of the femur could be employed without the patient feeling the faintest sensation of pain. For one or two days after these injections patients complain of cephalalgia, vomiting and general misery. With a scientific ardor truly Teutonic, Bier practiced these injections upon himself and upon one of his colleagues, Hildebrand by name. In five to eight minutes after the injection the legs were entirely anesthetic; under one-twelfth of a grain of cocain this anesthesia lasted forty-five minutes; it then gradually passed away. The after-effects were extremely severe in both cases, Bier being kept to his bed for several days.

PETER THE GREAT AS A DENTIST.—With respect to the recent Dental Congress in Russia, it may be of interest to note that the introduction of medicine into Russia was one of the many reforms carried out by Peter the Great. He encouraged foreign physicians to settle in Russia; he established pharmacies; he founded hospitals in which provision was made for the training of pupils. Medical degrees were conferred for the first time in Russia by the Moscow school in 1723. Peter the Great was personally greatly interested in medicine, and he even threw himself into the practice of surgery with characteristic ardor. He could bleed, draw teeth, and open abscesses, and he worked for a time regularly at practical anatomy and operative surgery. He used to carry about a small dressing case in order that he might be prepared to deal with any surgical emergency that arose. He insisted on being kept informed of all interesting cases, operations and necropsies in the hospitals of St. Petersburg. He sometimes operated with his own imperial hand. Thus it is on record that he operated for a diffused suppurative condition of the leg in a merchant called Thomas. On April 27, 1723, he tapped the wife of the Dutch merchant Borst, who was suffering from dropsy.—*Dental Record*.

APPLICATIONS TO THE SKIN—M. Brocq calls attention to the fact that certain medicinal applications are not well tolerated by the skin, especially in irritable subjects. Applications of corrosive sublimate solution, in susceptible subjects, are very irritating to cutaneous surfaces. Van Swieten Sol.

(mercuric chlorid, 1 to 1,000) is too concentrated to be used as a permanent dressing, especially if it be covered by an impermeable covering. It is well to remember that the skin of arthritics and neurasthenics is very sensitive. Salol can produce violent irritation of the skin and its application to it is to be avoided. There are some skins that cannot tolerate any medicinal applications; it would seem that in these cases the ideal method would be to protect the diseased area or areas from irritation and use starch as a topical application. This is often practicable. A patient recently came to M. Brocq who had an eczema of the leg, which had been subjected to the most appropriate and rational treatments of eczema, with only one result, aggravation of the eczematous lesions. The sore was large and unhealthy looking. Leg was put in a bag filled with starch. The starch was to be renewed every 48 hours. The wound was carefully cleansed by compressors dipped in boiled water, and crusts removed at each dressing. This treatment continued for 15 days and resulted in a complete cure. In another case, which had resisted various treatments for four months, the application of starch in the same way resulted in rapid recovery.—*Med. Standard.*

ENCYCLOPEDIA KNOWLEDGE.—Dr. F. D. Bird (*Intercolonial Medical Journal of Australasia*, March 20) in an address to medical students said: "There are two extremes of students—the one who will not take the trouble to acquire knowledge; he, of course, drops out early, but his antithesis is always acquiring knowledge, until he becomes a walking encyclopedia. Now, I would warn you against becoming an encyclopedic student, overweighted with loads of learned lumber, which you will not be able to use quickly and effectively as your profession will require of you. This student is apt to think that his quantity of knowledge has the quality of wisdom. There is such a thing as being too knowledgeable, and the frame of mind in which such a student is apt to get reminds one of the horse that Canon MacCall tells about: 'A friend of mine,' says the Canon, 'once shared the box seat with the driver of a stage coach in Yorkshire, and being a lover of horses, he talked with the coachman about his team, admiring one horse in particular.' 'Ah,' said the driver, 'but that 'oss ain't as good as he looks; he's a scientific 'oss.' 'A scientific horse,' exclaimed my friend. 'What on earth do you mean by that?' 'I means,' he replied, 'a 'oss as thinks he knows a deal more nor he does.' Now, we all think as this scientific horse thinks, but the encyclopedic student excels the most scientific of horses in this respect. Encyclopedic knowledge, carefully garnered in years of seeing and thinking, is a magnificent mental asset, but it is otherwise when stowed away rapidly and not thought over as it is received. The sixty-ton guns of learning score heavily at times, but it is the quick-firing mental armament that you especially require in our profession."

TONGUE IN INFLUENZA.—M. d'Hotel (*Medical Press*, June 14, 1899) draws attention to the character of the tongue constituting a pathognomonic sign of that mysterious affection known as influenza. If the malady is observed during the first few hours of its invasion the tongue may not present any abnormal feature, but the following day it is invariably covered with a white

coating more or less thick towards the center. Later on, according as the affection is of a benign type or becomes complicated or prolonged, the lingual coating is seen to diminish from the point or on the contrary to remain. This label of influenza is in general the last sign to disappear, and it is not rare to observe three weeks after the debut a remainder of a whitish triangle at the base of the tongue, indicating that the patient not only has been through the malady, but also that he is not yet absolutely free from the morbid condition, although the general state of his functions may appear regular—an imprudence on his part, a cold, might provoke broncho-pneumonia, gastro-enteritis, or some other complication. Another characteristic of this lingual deposit is to redden litmus paper when rubbed on it, and not only during the first days of the malady, but so long as there remains a trace of it on the tongue.

This acidity persists so long as there remains any trace of the fur, and is a natural indication of the treatment, which is that of frequently rinsing the mouth with an alkalin solution such as Vichy water, followed by the internal administration of the same. It is evident that influenza cannot be cured more than typhoid fever, but M. d'Hotel affirms that complications were much rarer where the alkalin treatment was used.

SECTION MEETINGS.

Tended the section meetin's—
 Better ha' left 'em alone—
 Got a twinge in my littlest muscle
 An' a ache in my biggest bone.
 I was young an' spry an' light-hearted,
 An' I'm ol' an' rheumatic an' sad—
 I'm like the Biblical feller,
 Too much larnin' has druv me mad.
 Never knowed that I had one—
 A larynx—an' I'll be blowed
 If I ain't been a-coughin' steady—
 I wisht I'd ha' never knowed!
 Them otological fellers—
 Since they spoke I ain't heard a word—
 Them ophthalmological fellers—
 An' my eyesight's dim and blurred.
 An' them there surgical fellers—
 Gee! But they'd raise your hair!
 I have to keep feelin' my arms an' legs
 To see if they still are there.
 My pore ol' head is achin'
 An' my pore ol' brain is strained,
 My heart is chuck full o' my sorrows
 An' I believe that my soul is sprained!

MOORE CUMMIN. —Ec.

HOSPITALS NOT LIABLE FOR DAMAGES FOR UNAUTHORIZED AUTOPSY.—A Philadelphia judge, in refusing a new trial in a suit for damages against the German Hospital, has decided that as a public charity, possessed of no funds except such as have been contributed by the charitably disposed for the furtherance of its philanthropic purposes, the diversion of its assets to compensate for injuries inflicted or occasioned by the wrongful acts of its agents or servants would be against all law and all equity.—*Med Record, Oct., 1899.*

FOLLOWING UP INQUIRIES.—Too much skill cannot be devoted to following up inquiries that result from an advertisement. The fact that a man or woman has taken sufficient interest in your goods to write a letter asking for information or a catalogue indicates a need for the article advertised and a probability of making a sale. The advertisement itself may be only a bait to bring nibbles from possible customers. An inquiry received, the case then becomes one of salesmanship, and all the skill at command should then be devoted to making the sale. The inquirer should never be dropped until the advertiser is convinced that a sale to him is an impossibility.—*Advertising Experience.*

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As a cleansing wash and dressing in the treatment of alveolar abscess, and for all ulcerated surfaces, Listerine is invaluable.

After the extraction of teeth, Listerine, properly diluted with water, is especially grateful to the patient.

To prevent the various fermentations and destroy the activity of the living particles which constitute contagion, Listerine may be depended upon to exercise the desired inhibitory action.

As a dressing to pulp canals after the removal of putrescent pulps, and as a general purifying agent in the treatment of the antrum, Listerine is highly recommended.

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The absolute safety and efficiency of Listerine will always give it favor over dilutions of poisonous or corrosive chemicals.

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odorless and almost tasteless,
thoroughly correcting depraved
secretions and destroying the
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of peculiar merit, penetrating
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